

# The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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## Hardened and Tempered Glass.

In a paper read before the British Society of Arts a short time ago, Mr. F. Siemens spoke in an interesting manner of the above subject. Having satisfied himself by a series of experiments of the true cause of the spontaneous fracture of glass, Mr. Siemens invented processes of manufacture by means of which glass may be thoroughly toughened, or, as he prefers to call it, hardened. The principle upon which the processes depend consists in cooling the glass, not in proportion to its surface, but to its volume or capacity for heat. The method employed will be readily understood by considering a sheet of uniform thickness, which, after having been heated uniformly to a sufficient degree, must be cooled on the surfaces of its two parallel sides only, leaving the edges uncooled. This is done by placing the heated sheet of glass between two cold slabs of suitable material, prepared in a peculiar manner. Uniform cooling of the whole sheet is thus secured, no matter what its shape, because the edges are not subject to the cooling influence caused by the surfaces between which the glass is placed. The plan adopted for various articles varies with their shapes, but it is on the principle of uniform heating and cooling that the author's processes of manufacturing hard glass are based. Of these the two principal are known as press-hardening and casting, but, besides these, there is a third, theoretically less perfect than the others, viz., semi-hardening or hard-tempering; this, though less important, may be advantageously employed where presses would be unsuitable and casting impossible or difficult, as in the case of bottles, lamp chimneys, &c.

Press-hardened glass has now been made, with constantly-increasing success, for six years. The articles are mainly of plate and sheet glass, either flat or bent into a variety of shapes. Besides plain work, decorated sheets, such as sign boards with enameled inscriptions, figures and other ornaments, form an important part of the goods produced; the process, as already stated, is, therefore, one of manufacture (the goods receiving through it their definite shape and decoration), and not simply one of hardening or toughening. The glass is so hard that the diamond will not touch it, and it cannot, therefore, be cut or bent after manufacture; it may, however, be polished, etched and slightly ground; its strength is at least eight times that of ordinary glass.

The process of manufacture is as follows: The glass is first cut in the ordinary way to the requisite shape and dimensions, and is then exposed to the radiant heat of a peculiarly-constructed furnace until quite soft; as soon as it has attained the necessary temperature it is placed between cold metal plates, to be cooled down with a rapidity which varies with the thickness of the glass, but is in any case very great. The heating and cooling of sheet glass of ordinary thickness last altogether a minute and a half, a minute being the length of the heating and half a minute that of the cooling operation. It is a remarkable circumstance that glass may be thus heated and cooled in so short a space of time without either cracking or breaking; this is altogether due in the case of the operation of heating to the uniform temperature of the furnace, and to the heat being produced entirely by radiation; should these conditions not be fulfilled, the glass would break to a certainty. As regards the success of the cooling operation, this depends upon the uniform temperature of the glass before it is cooled, and upon that of the metal plates between which it is placed while being cooled. This uniformity of temperature and the total absence of draft, which would cause irregular cooling, are the conditions under which the whole operation can be carried on with assured success.

The surface of the metal plates or molds used for the presses may be so prepared as to produce more or less cooling effect on the glass as required. If the glass is to be hardened to a very high degree, the metallic surfaces must be of very high heat-conducting power, such as copper, and must be left quite bare; the glass must also be raised to a very high temperature, as it would otherwise crack during cooling. If it is proposed to harden the glass to a lower degree, surfaces of iron are used, this metal not being so good a conductor of heat as copper, while the temperature of the glass is also kept lower. By covering the surfaces of the iron presses with wire gauze, their cooling effect may be reduced to any required extent, so that a certain amount of hardening may be produced without rendering it necessary to heat the glass to such a temperature as to make it difficult to handle, or to cause it to stick to the furnace-bed. If a still lower degree of hardening is proposed, the faces of the presses may be covered with asbestos paper, or even clay slabs may be employed.

Semi-hardened glass is made in the same large radiation furnaces as press-hardened, by means of the hard-tempering process, of which the following is a description: Finished articles, which are of a shape to which presses cannot be easily applied, such as bottles, are heated up to a temperature short of softening; each one is then placed in a casing of sheet iron, which is so arranged that the heated article shall not touch the inner sides of the casing. In order to effect this, the casing is provided with internal projecting ribs which retain the glass article in position, touching it only at a very few points. The casing,

with the heated article of glass within it, is allowed to cool in the open air. Whenever it is a difficult matter to handle the heated glass, instead of placing it hot into the casing, the casing with the glass inside it is inserted in the heating furnace for the requisite time and then allowed to cool, as before described.

The third and last process to be described, which Mr. Siemens considers the most valuable of the three, is a peculiar mode of casting hard glass. This has not yet been introduced on a manufacturing scale, but the experimental castings produced have turned out to be quite satisfactory in every way.

is to be produced. Glass cast in this way may have almost any variety of form and inequality of thickness. In the last respect this process differs entirely from those previously described, in which only glass of uniform thickness can be dealt with. If care be taken that the surface of the glass does not approach the outer casing of the mold, it does not much matter how the cooling is effected. The great point is that the mold and glass should be brought to a uniformly high temperature, which should be rather above that at which press-hardened glass is made. When fully heated the mold is taken from the furnace and allowed to

largest surfaces to the cooling influence, and hence in the one case there is a strong tension or strain in the molecules, which causes them to break up spontaneously; and in the other case, to counteract that tendency, it is necessary that the glass should be cooled very slowly.

## Ancient Foundry Practice.

The cupola, like other modern appliances, simple as they may appear to us to-day, has had its history, and has developed gradually into the forms and into the capacity which

precipitated the fact that it would be possible to melt the iron more quickly, if the fuel were brought into direct contact with it, and small cupolas, or rather the germ of what is our cupola to-day were then in use. It was a modification of the crucible, which was considered necessary for the accumulation of the molten iron. Instead of charging the iron into a crucible and placing it in the fire, it was put under a shaft, open below, and fitting the crucible well. Then the iron and fuel were charged into the top of the shaft, which at its lower end was provided with a clay crucible, into which air was blown by leather bellows. The shaft was 20 to 24 inches high. When melting was to begin the shaft was placed on top of the crucible, the seam luted with clay and the lower part of the apparatus covered by fine charcoal. Fig. 1, reproduced from Réaumur's book, shows such a cupola in full blast at the left hand, the crucible not being visible. It represents the model practice of the day at the Cusin Foundry, Faubourg St. Antoine. The cupola was first heated by burning charcoal in it, and then it was charged with the iron broken into small pieces. When the necessary quantity was melted the blast was stopped, the top taken off and the crucible poured out in the manner shown to the right in Fig. 1.

Curiously the principal use for this early type of cupola was by itinerant foundries, who traveled about the country carrying their furnaces with them. Naturally, crucible melting was not adapted to this trade, which Réaumur quaintly describes as follows: "There are foundries who do nothing every day but to melt cast iron and no other metal. Their number is not large, and I do not know whether there are more than one or two in Paris. These foundries travel through the country and make their appearance gradually in different provinces. They make cast-iron weights, plates for different purposes, cast new and patch old hollowware. These foundries buy the pig iron they want from peddlers who gather cast-iron scrap in the villages. In the vicinity of Paris this scrap is exchanged for apples. A man with scales in one hand, leading a horse laden with poor fruit, does the business, exchanging apples for iron, weight for weight."

The difficulty of handling the shaft or top was a limitation to the size of the apparatus in foundries, and Réaumur tried to overcome this drawback by hanging it in trunnions, like the Bessemer converter of our own day, simply tipping it to pour the iron from a taphole located opposite the tuyere. Réaumur's plan is shown in our engraving, Fig. 2. The whole apparatus, it will be seen, was mounted on a frame provided with rollers. Cupolas of this design were not introduced till long after Réaumur's death, toward the close of the eighteenth century, and even then found favor more extensively abroad than in Réaumur's native country. Norbert, a Swedish mining official, reports that he saw cupolas of this design in Russia in the beginning of the present century which were 7 feet high, and they were afterward introduced into Sweden. Although Réaumur's writings show him to have been fully aware of the direction in which further progress must be sought, the modern cupola, with fixed shaft and bottom tapping, was first brought out in England, probably in 1790, by Wilkinson, that at least being the name under which the cupola was known as late as the third decade of the present century on the Continent. As an example of the consumption of fuel in these cupolas, which would appear extraordinary in our day, it may be stated that it took 100 pounds of coke to melt 130 pounds of iron at the Antonian-hütte at Gleiwitz, in Germany, in 1804. Progress since the first little shafts in Réaumur's days has certainly been great, and has, we believe, been especially marked during the past ten years. New ideas, new forms, are constantly coming up, and the old standard form of the last decade, which is scattered by the hundred in old foundries and machine shops, is slowly giving way to new types.

There are something like 800 men engaged in building iron steamers in one establishment in Norway. On comparing the wages paid at the yard in question, Mr. Raylton Dixon, a well-known shipbuilder of the Tees, estimates that upon a vessel of a given size the labor will cost 25 per cent. less than that expended on a similar vessel built in England. Deduct from this advantage the freight on the materials used in its construction, which at the present time, with the exception of timber, are imported from England, and the result is the Norwegian builder can turn out a 1500-ton vessel more than \$2500 cheaper than his English competitor. This, be it remembered, is from English authority. The same authority further admits that as soon as the German plate mills are placed upon the same footing as those in England, which are laid out for rolling large quantities of ship plates, England will behold this trade slip away from her unless the workers will submit to still further reductions of wages.

The trade statistics of Buenos Ayres for the past year are published. The imports in 1884 rose to \$91,000,000, or \$15,000,000 over the preceding year; and there was likewise an increase of exports, namely, \$67,000,000, against \$60,000,000 in 1883.

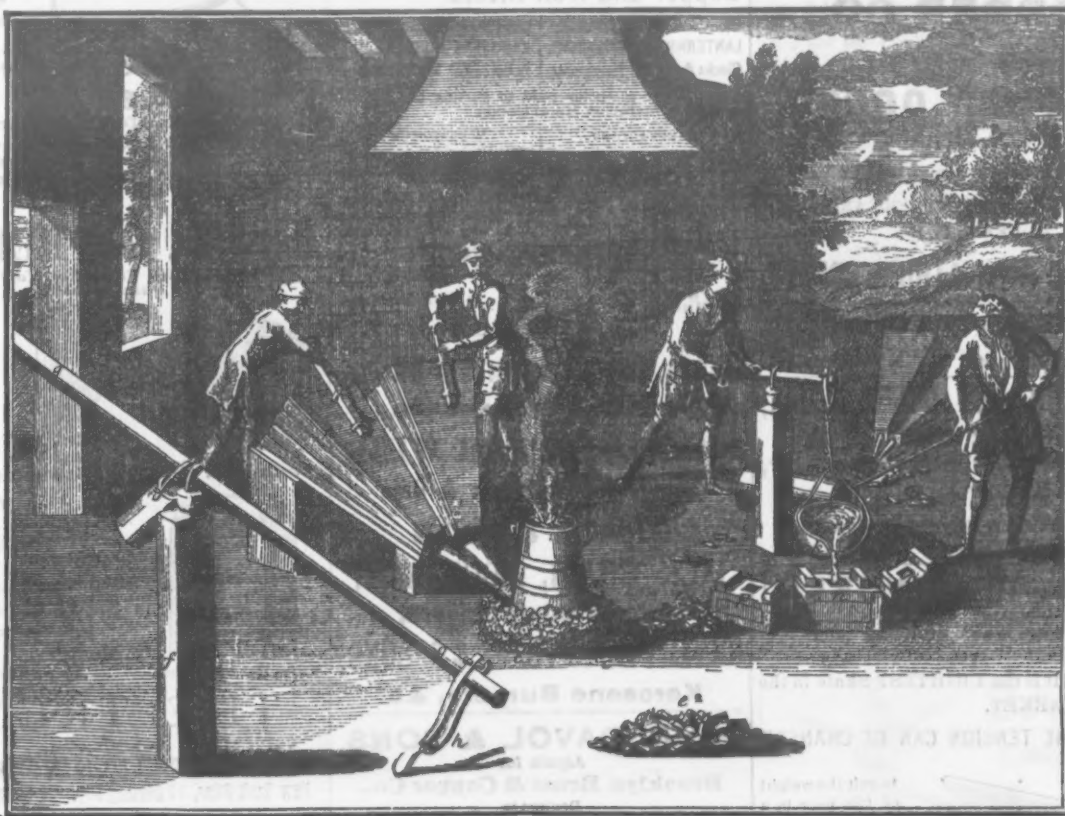


Fig. 1.—The Cusin Foundry in the Beginning of the Eighteenth Century.

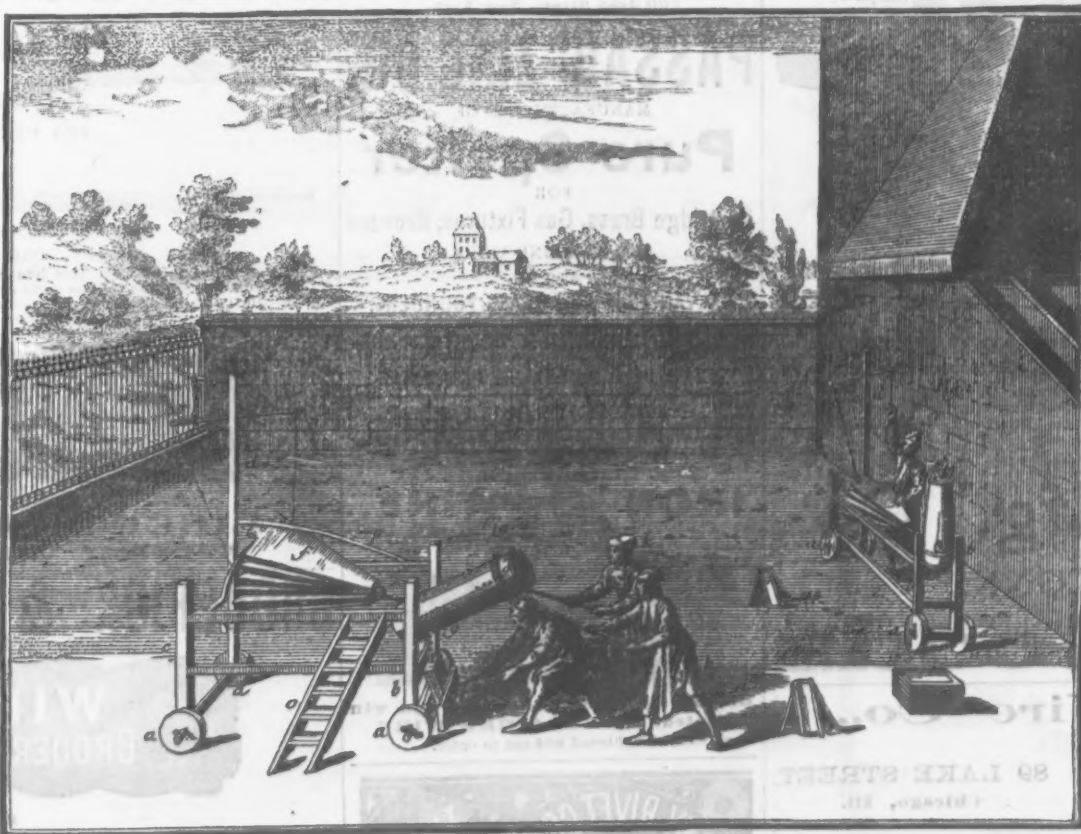


Fig. 2.—Réaumur's Tilting Portable Cupola.

## ANCIENT FOUNDRY PRACTICE.

They consist of floor plates, grindstones, pulleys, tramway sleepers and various ornamental work.

Hard cast glass is manufactured in the following manner: Glass, melted in a tank furnace is tapped into molds, as with iron castings. The process thus far resembles that carried on in an iron foundry, but differs from it, inasmuch as a special material is used in place of sand, and that the mold and the glass inside it are heated and cooled together. The material or mixture to be used in place of sand must be selected so as to have as nearly as possible, the same conductivity and capacity for heat as glass; in such a case the glass and mold forming, as it were, one homogeneous body, the glass will cool without cracking, even if the cooling process is comparatively quick, which is quite necessary if hard glass

cool in the open air, which generally acts quickly enough to produce a good hardening effect upon the glass within. When cold the mold is opened and the glass removed.

It will be readily understood, from the descriptions given that the three processes differ so materially from one another that hardly any resemblance remains to show that they are merely different ways of treating differently-shaped articles in carrying out the principle of keeping the whole body of the glass at a uniform temperature during the operations of heating and cooling.

The De la Bastie process, as well as the ordinary tempering processes employed, fail in not being founded on the principle set forth; glass toughened by the De la Bastie process being cooled in a fluid bath, and ordinary glass in kilns, the cooling action is most active on the portions offering the

are now regarded as standard. Professor Ledebur, of the Royal School of Mines, at Freiberg, Saxony, has lately, in a valuable contribution to *Stahl und Eisen*, traced the early history of iron founding. In the beginning of the eighteenth century there were very few furnaces which produced more than a ton a day of pig iron. It did not take a large force of molders to provide for such an output, and the iron was almost universally cast direct from the furnace. Large concerns had two or three furnaces, and, when they happened to be out of blast, buyers had to wait until the works were ready to go on. Réaumur in his famous work, published in 1722, gives the fullest account of the practice of his day. It appears that in the early part of his century what little iron had to be remelted was fused in crucibles. Réaumur fully ap-



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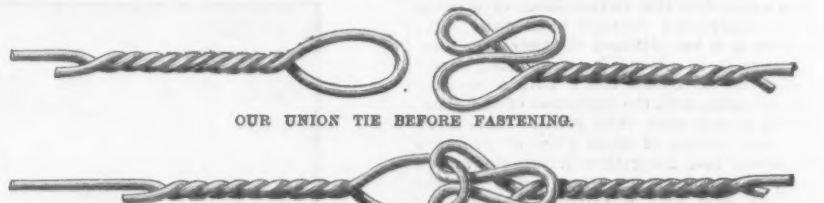
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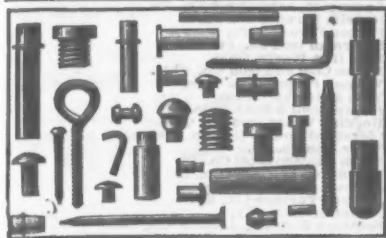
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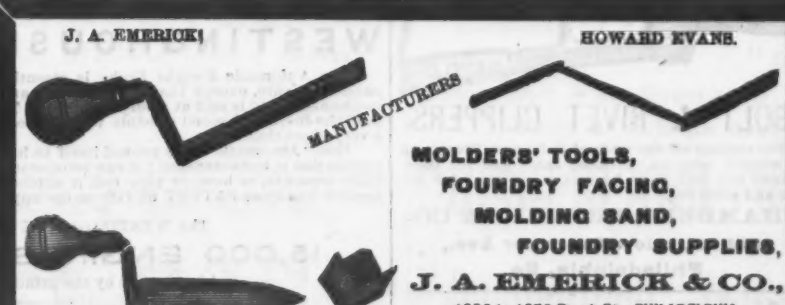
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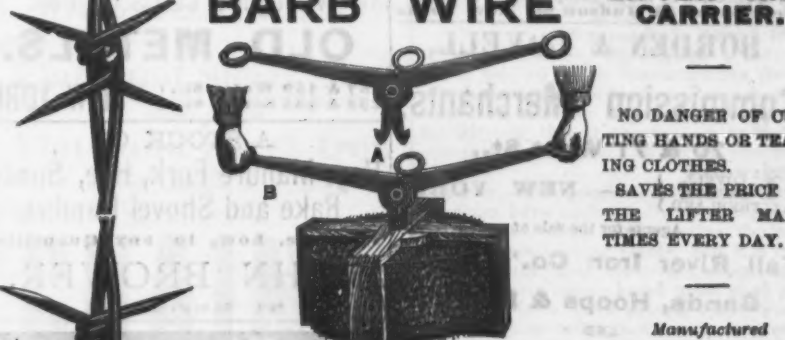
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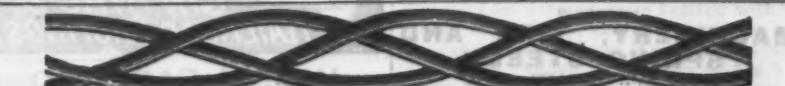
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Analysis of Ores of Iron and other Metals,  
Pig Iron and Steel. Assay of Gold and  
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Manufacturing and Household Use.

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**BESSEMER ORE,**  
Specially adapted to Soft Foundry or Highest  
Grades of Mill Iron.  
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**PLYMOUTH ROLLING MILL CO.,** Conshohocken, PA.  
MANUFACTURERS OF  
**Pig Iron,**  
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**Plate and Sheet Steel,**  
Every description of Light Plates and  
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**Plate and Sheet Iron,**  
Best Bloom, Tube, Cleaned, Best Refined,  
Skelp, Blue Annealed and Common.  
Particular attention given to Iron for Special Purposes.

**TESTED CHAINS.**  
**BRADLEE & CO., EMPIRE CHAIN WORKS,**  
816 Richmond St., - - - PHILADELPHIA.  
Chains for Foundry Cranes and Slings.  
"D. B. C." Special Crane Chain.  
Steel and Iron Dredging, Slope and Mining Chains.  
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MANUFACTURERS OF  
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**LOCOMOTIVE AND CAR-WHEEL TIRES**  
Manufactured from the celebrated OTIS STEEL BRAND  
**STANDARD**  
Quality and efficiency fully guaranteed. Prices as low  
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**ANALYTICAL AND CONSULTING CHEMISTS,**  
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Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the  
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CARBON ROLLING MILL CO., Limited,  
Best Quality Muck Bar.  
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**ANDOVER PIG IRON,**  
FOR BEST MILL PRODUCTS.  
Andover OHIO Iron for Carwheels, &c.  
Each pig marked exact chill depth (3/4 inch to 1/2  
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**CHARCOAL PIG IRON,**  
Also  
WOODBIDGE CLAY MINING CO.'S FIRE BRICK

**The Work of the Hartford Steam  
Boiler Inspection and Insurance  
Company.**

We present herewith a summary of the  
work done by the inspectors of the Hartford  
Steam Boiler Inspection and Insurance Com-  
pany for the year 1884, and, for the purpose  
of ready comparison, the summaries for the  
preceding year and the whole time that the  
company have been in business to January  
1, 1885:

	1884.	1883.
Visits of inspection made.....	34,048	29,334
Total number boilers inspected.....	66,935	66,142
Total number boilers inspected in- ternally.....	34,855	31,408
Total number boilers tested by hy- draulic pressure.....	4,180	4,275
Total number defects reported.....	44,900	40,953
Total number dangerous defects reported.....	7,419	7,472
Total number boilers condemned.....	403	545

The following is the detailed analysis of  
defects reported during the year 1884:

Nature of defect.	Whole number.	Dan- gerous
Cases of deposit of sediment.....	4,870	446
Cases of incrustation and scale.....	7,078	552
Cases of internal grooving.....	214	58
Cases of internal corrosion.....	1,645	218
Cases of external corrosion.....	2,608	358
Broken and loose braces and stays.....	706	337
Settling defective.....	2,128	322
Furnaces out of shape.....	1,448	142
Fractured plates.....	1,428	551
Burned plates.....	1,236	321
Blistered plates.....	2,233	300
Cases of defective riveting.....	4,398	561
Defective heads.....	418	145
Serious leakage around tube ends.....	6,115	1,276
Serious leakage at seams.....	2,488	559
Defective water gauges.....	1,230	182
Defective blow-offs.....	544	134
Cases of deficiency of water.....	165	80
Safety-valves overloaded.....	327	129
Safety-valves defective in con- struction.....	440	177
Pressure gauges defective.....	2,319	100
Boilers without pressure gauges.....	31	13
One defect unclassified.....	1	...
Total.....	44,900	7,419

Grand total of the inspector's work since  
the company began business to January 1,  
1885: Visits of inspection made, 275,223;  
whole number of boilers inspected; 500,079;  
complete internal inspections, 106,436;  
boilers tested by hydrostatic pressure, 42,  
158; total number of defects discovered,  
303,718; total number of dangerous defects,  
64,216; total number of boilers condemned,  
3716.

#### Exhaust Steam for Heating.

We take the following correspondence  
from *Mechanics* for April:

BUFFALO, N. Y., March 5, 1885.

To the Editor of *Mechanics*: Will you  
through your paper give me some informa-  
tion in regard to the use of exhaust steam  
for heating purposes. I find that there is a  
difference of opinion among practical men as  
to whether it can be used to advantage. I  
should be glad to hear something on the sub-  
ject from some one who has given it a full  
and fair trial. The question seems to be  
simply: Does the back pressure caused by  
the use of exhaust steam through coils or  
radiators neutralize the advantage of its  
use for heating purposes?  
J. R. L.

BUFFALO, N. Y., March 3, 1885.

To the Editor of *Mechanics*: I have re-  
cently read an article recommending the use  
of exhaust steam for heating a large factory,  
instead of allowing it to escape freely into  
the air. If this is practical it looks like  
quite a saving of fuel. What do you think  
of it?  
ANTI-WASTE.

Answer.—The questions asked by our cor-  
respondents have undoubtedly often suggested  
themselves to those contemplating the erec-  
tion of steam-heating plants, and it is more  
than probable that the arrangements made  
in many cases, unless based upon good pro-  
fessional advice, have proved either wholly  
unsatisfactory or at best much less satis-  
factory than they might have been. It is  
apparently forgotten in numerous instances  
that the plant designed for one system of  
heating cannot yield good results in connec-  
tion with some other system, and, accord-  
ingly, live-steam heating plants should never  
be used for exhaust-steam heating with any  
hope of economy, and, vice versa, the com-  
paratively greater cost of the exhaust steam  
plant not making it advisable to use it ex-  
cept for the purpose for which it was de-  
signed. Exhaust-steam heating is entirely  
practicable, and, if carried out according to  
proper designs, will, in point of economy,  
almost always compare favorably with, and  
often prove much more advantageous, than  
live-steam heating, the heating medium  
being practically a waste product, and its  
cost consequently nothing.

To employ exhaust steam satisfactorily,  
however, it should be remembered that the  
density of steam or its weight per  
cubic foot increases almost in direct  
ratio with the pressure and that the  
heat radiated from a given surface dim-  
inishes with the reduction of temperature  
of steam used. Provision must be made,  
therefore, to supply a greater quantity of  
steam by making the supply-pipe larger  
than would be necessary for live steam, and  
the heating surface must also be enlarged  
proportionately. All the distributing-pipes  
and the apparatus generally should be made  
sufficiently large to reduce back pressure in  
the engine cylinder as much as possible, and  
for this reason it is advisable to abandon the  
use of coils and radiators, which do a great  
deal toward resisting the free circulation of  
the steam. The ideal system of heating by  
exhaust steam would, of course, be one in  
which the steam from the engine is carried  
away so promptly that there is no back pres-  
sure on the piston greater than the atmos-  
pheric pressure, and then the gain would be  
the entire heating done. Such a condition is  
very difficult—in fact, impossible to attain—  
as a certain amount of pressure is necessary  
to drive the exhaust steam into the open air,  
and if it be forced into a heating system a  
still greater pressure will naturally be neces-  
sary to overcome the additional friction in  
passing through the pipe system. As it is  
desirable to know the limits in which, not-  
withstanding the back pressure, the exhaust  
steam may be used profitably, it may be of  
interest to state that some two years ago  
we supplied the following formula:

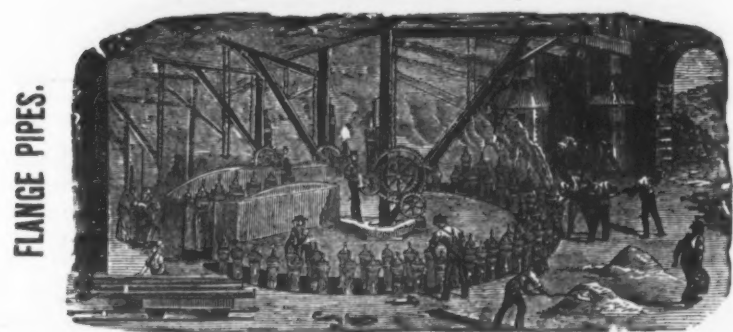
Back pressure =  
Number of cubic feet of space heated.

Cubic feet of steam used in engine per hour.  
This formula, which gives the limit of



# A. H. McNEAL,

BURLINGTON, N. J.



## CAST IRON PIPES,

FOR WATER AND GAS.

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## HAMMERED AND ROLLED STEEL,

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BEST REFINED TOOL CAST STEEL

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For Rollers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

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## Light Steel Rails,

40 lbs., 35 lbs., 30 lbs., 25 lbs., 20 lbs. and 16 lbs. per yard.

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Manufacturer of John Sommer's

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Mallets and Variety Wood Turning.

All first quality faucets must be labeled. No goods genuine unless  
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JOHN SOMMER'S BEST BLOCK TIN.

Cork Lined, first quality,  
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Key, Lignumvite Key, Rose-  
wood, Red Cedar, Cherry and  
Butternut Faucets.

John Sommer's Best Block  
Tin Key and First Quality  
Cork-lined Faucets are the  
best. Send for catalogue.

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SIEMENS OPEN HEARTH STEEL CASTINGS FOR  
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## Open Hearth and Crucible STEEL CASTINGS.

QUALITY EQUAL TO STEEL FORGINGS.

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STEEL INGOTS, Best Stock, Furnished to Order.

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We are prepared to make all kinds of Heavy or Medium Weight

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FROM

### OPEN HEARTH METAL.

We wish to give special attention to making Cast Steel Rolls of all sizes, Mill  
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&c., for Steam and Blowing Engine construction.  
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## HICKS & DICKEY, MANUFACTURERS AGENTS STEEL & IRON FORGINGS.

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and uniformity to any English Steel. Sole agents for the

### HARTMAN STEEL CO.

Machinery, Spring, Tire, Toe Calk, Sleigh and Axle Steel. Boiler Plates, Iron or Steel, Tank,  
Stack and Sheet Iron. Bar Iron, Norway Iron, Bars and Shapes.

Sole Agents for W. S. SIZER'S STEAM FORCE.



We can furnish Forgings of any size, either Iron or Steel, plain, forged or rough, turned any diam-  
eter up to 30 inch, 35 feet long.

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AT SAME PRICES AS IRON WASHERS.  
GUARANTEED FAR MORE RIGID THAN ANY IRON WASHERS,  
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PATENTED Nov. 2d, 1880.

PATENTED Oct. 16th, 1883.

STEEL FORGED, CASE HARDENED AND HIGHLY POLISHED.

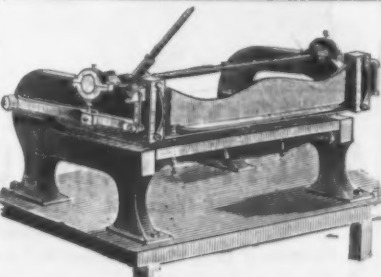


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Is the BEST WRENCH ever offered for  
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Reasons Why.—It is forged from solid Steel, Case Hardened, finely  
fitted and highly polished. It adjusts more rapidly and accurately. It  
gives the grip of a vise. Therefore it never slips, to the injury of the  
hands of the Operator, Nut, Wrench or surrounding machinery. The  
Jaws are in perfect parallel line. It can be applied or fastened to the  
corners as well as the face of the nut. This allows giving the eighth  
turn in corners or difficult places, the same as ordinary wrenches act on octagon nuts.  
In removing nuts from carriages, the wrench is set tightly upon the nut, and the hands  
are not brought in contact with the black oil. It is a complete hand vise for holding all  
articles within its capacity. In using the Diamond End, it holds the nut without  
setting up the thumb-screw. For sale by all Hardware Dealers throughout the United  
States. Manufactured by

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## WALS' PATENT COMBINED SLITTING AND SQUARING SHEARS.

No. 3 Machine is the only Hand Lever Shears,  
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It is specially constructed for slitting wide sheets,  
lengthwise, up to 36 inches wide, and will cut a strip  
of 18 inches wide, or less, of any length; will cut No.  
16 Iron with ease; 32 inches wide; is powerful  
and easily handled by lever only. It is simple in con-  
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market, and we  
think has the  
largest sale. It  
holds the window  
at any point, and  
locks the same  
when down, and  
entirely prevents  
wind from rattling.  
It is the sole  
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patent, and so  
manufacturer of  
these fasteners,  
and all persons  
are hereby notified  
of this fact. Any  
parties infringing  
will be dealt with  
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Parties who have  
been buying and  
selling the "Prac-  
tical Fastener,"  
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warning. Orders  
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Of Cotton, Linen & Steel,  
FOR ALL PURPOSES.

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and Force Pumps,  
Wind Mill Pumps,  
HAND AND POWER  
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BOILER FEED PUMPS,  
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Manufacturer of  
Patented  
BRASS, BRIGHT  
TINNED WIRE  
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The cheapest and most  
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Full size of Band for Brass and Tinned Wire Cages.

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Manufacturers of  
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of every description, from best Cast Steel,  
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MANUFACTURERS OF  
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**OVERHEAD RAILWAY,**  
With Switches and Turntables.  
THE  
**HARRINGTON HOISTS,**  
Wythe Elevators,  
WITH AUTOMATIC STOP.  
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**NEW MAKE OF MINE LAMP.**  
THREE DIFFERENT  
SIZES  
SEND  
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The Oldest and Most Extensive Manufacturers of  
**PUMPS, HYDRAULIC RAMS, GARDEN ENGINES,**  
Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill  
Pumps and other Hydraulic Machines in the World.

FIG. 120. FIG. 209. FIG. 70.

**Wrought Steel Sinks.**

One of the strong points of these sinks is the new coupling, with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

**BRANCH WAREHOUSES:**  
85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

**UNION MANUFACTURING CO.**  
SOLE MANUFACTURERS OF  
**Skinner's Patent Combination Chuck.**  
UNIVERSAL, INDEPENDENT AND ECCENTRIC.

By sliding a stud on the back of chuck it is instantly changed from Universal to Independent, and vice versa. Each Chuck is guaranteed perfect. All parts are made interchangeable. Only the very best materials used in their construction. Reverse or special jaws furnished when desired.

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back pressure within which it is advantageous to use exhaust steam, shows that the back pressure may without disadvantage be very great when the space heated is considerable. As an illustration of the degree to which back pressure may be avoided, it may be well to state here that some time ago in building a candle factory in this city an exhaust-steam heating plant was agreed upon, and, after having been in practical operation for several months, an indicator card taken from the engine showed that the total back pressure amounted to something less than 1 pound, and the expense of heating the establishment was thus reduced to only a nominal figure. Heating by exhaust steam has the disadvantage of requiring a greater first cost in erecting the plant, but, as this will very soon be covered by the saving of fuel effected, the advantages of the system will be readily appreciated.

#### Technical Education.

At the present time the general subject of technical education is being widely and earnestly discussed. Employers are beginning to see that the supply of trained workmen will not remain inexhaustible if nothing is done to replenish it. Parents are beginning to perceive that their sons might do better than to become bookkeepers or clerks superfluous clerical men or unemployed physicians. Even young men who are entering upon the active duties of life are beginning to feel that the generous wages paid to skilled foreigners would be more pleasant to receive than the small salaries paid by shopkeepers or the meager incomes received by professional men. Various journals have given the subject attention, and have frequently directed attention to the crowded ranks of the shabby genteel. "Bright, able-bodied young men," says one writer, "toil away at bookkeepers' desks or bleach in the gloomy recesses of dry-goods stores at pay which mocks soul and body, when, if their brains and hands had been made acquainted with a good trade, they would have enough to make life fairly worth living." Another exclaims: "Throughout the length and breadth of the land there is a cry for such an addition to the education of our youth as shall fit them for some other business than standing behind counters or sitting at desks." These extracts fairly represent the sentiment of many of those who have given attention to the problem.

To what extent the public schools should change their present course of study and undertake the business of technical education is a question of considerable importance. One of the trade organizations some time since issued a circular, addressed to those who have the supervision of public education, expressing its sense of the high importance of reinforcing the ranks of mechanics by a system of public-school education which shall fit boys to enter into trades and afford some assurance that their preparatory studies will be likely to assist them in making themselves intelligent and skilled workmen. The circular explains that very few of the pupils of the technical schools, although they may have attended the public schools previously, have had any instruction in freehand drawing and geometry. These studies are included in the ordinary school course of the cities and towns, and attention is directed to the fact that boys intending to learn trades leave school earlier than those intending to follow the professions, and usually before reaching that part of the school course in which freehand drawing and geometry are taught. Accordingly, they are deprived of the very studies which they especially need to make them skilled and intelligent mechanics. Other critics of the public-school system go further than this. They desire that the course of instruction should give boys and girls a practical knowledge of the industrial arts; that it should acquaint them with principles of construction, modeling in clay, and working in metals and the use of tools. Some of the public schools are at present actually trying the experiment of introducing into the usual curriculum a technical course of this sort. The great objections to such a change are that reading, writing and arithmetic must be taught, whatever else is neglected, and that it is impracticable for the public schools to teach the principles and practices of all the trades. Children from 5 to 15 years of age do not usually know to what pursuits they are best adapted. Some children who attend the public schools may naturally be expected to become members of the liberal professions, and finally, it is argued, the purpose of an education is as much to secure mental discipline as to acquire useful knowledge.

A correspondent of one of the weekly papers says it is not that the studies pursued in the schools are unnecessary, and not that the schools omit to furnish their pupils with industrial training. "It is the way in which they talk to the boys, teaching them to think of themselves as future Presidents of the United States, that is to be condemned." The pupils, he says, become victims of false ideals of life. They want to upset things. They do not have the resolute purpose to fit themselves thoroughly for their work. They do not intend to devote themselves for life to the trades they attempt to learn after leaving school. They do not care to become expert masters of their trades. They are dreaming of something else which they think worthier than the work and life of a skilled mechanic. For this state of things he blames the public schools. In support of this argument he directs attention to the fact that in all the school books the models held up for imitation are statesmen, lawyers, orators, &c., rather than those who have been earnest, conscientious hand-workers.

In this connection brief mention of some of the more prominent schools devoted to technical education will be of interest. In this city there are the Industrial Art Schools of the Metropolitan Museum of Art, the St. Johns School on 32d street, the Free Drawing Schools of the General Society of Mechanics and Tradesmen, on 16th street, the School of Messrs R. Hoe & Co., and a number of other similar institutions, all of which have responded to the demand of the hour for more practical education. There are also the New York Trade Schools, established by

Mr. Auchmuty, where boys are instructed in plumbing, brick laying, fresco painting, stone cutting, plastering and several other trades. For older and more advanced pupils there are available the Columbia School of Mines, the Sheffield Scientific School, the Princeton School of Science, the Stevens Institute, and the Sibley College of the Mechanic Arts at Cornell University. Of these the Industrial Art Schools of the Metropolitan Museum of Art have been established to provide thorough technical instruction in various branches and to furnish an acquaintance with the theory and the practice of the arts taught. The method proposed for accomplishing this end is that the various trades shall each appoint a competent instructor to give lessons at the schools, the trustees of the museum exercising a supervision and providing suitable models and other apparatus. Strange to say, the only trade that has so far operated with the trustees of the Metropolitan Museum in this manner is the carriage-building trade, represented by the Carriage Builders' National Association. A great obstacle encountered in the progress of these schools is the indifference of the trades themselves, with the single exception we have mentioned.

The indifference of some of the trades would seem to be that of calculation, if we may judge by the position said to be taken by the celebrated firm of Tiffany & Co., of this city. This house, it is said, argues that since there are firms that are unable to produce good designs of their own, and would like to appropriate such designs from those who can produce them, the only method to pursue is to educate their workmen in their own shops. Therefore they decline to cooperate with the Museum Schools. This position will no doubt be a surprise to many who have not considered the subject, but upon reflection it will be seen that there is self-interest at the bottom of it, and this may be supposed to control almost all such measures. Another difficulty with which the promoters of these schools have to contend is the hostility of the trades unions and other labor organizations. It is well known that trades unions undertake to limit the number of apprentices that may be entered in any establishment, thereby hoping to control the supply of labor. They recognize, therefore, in schools of this kind an agency which in a certain measure will defeat the purpose they have in view, and therefore by every means in their power they are opposing schools of the kind we have described. The trade schools established by Mr. Auchmuty have suffered severely from the opposition of trades unions, which in some instances have announced their unwillingness to allow the graduates from these schools to work in the same shops with their members.

With reference to the education of artisans Professor Huxley has written as follows: "For myself, I look upon simple knowledge by itself as of far less importance to the artisan in his career in life than a number of other qualities. I do not say that knowledge is not an extremely good thing, but if a man is to make a good workman, or to do anything in practical life, you must give him an education which fits him for the conditions of life with which he has to deal, and you will not give him that education by filling his head with a number of intellectual abstractions, or even by giving him the largest acquaintance with scientific principles. And I think it is a profound mistake, considering the career to which the majority of artisans or persons in that class of life are necessarily bound, ever to take them out of the wholesome discipline of practical contact with the realities of life for the mere sake of giving them a greater or less amount of knowledge. A man who is inclined to do so may always pick up knowledge, and he may do so at the same time that he is getting his education, in the highest sense of the word, out of his contact with the realities of his daily life; but if you make a bookworm of him, if you take him away from all that contact with reality and turn him back afterward into it, he has lost touch of life. I speak with the greatest hesitation, because I have nothing to do with industrial pursuits; but I have had to do with mankind in many stations in life, and it seems to me that what is wanted in a foreman is a man of energy, punctuality, business habits and power of dealing with men, all of which things are not to be got out of books or laboratory work. Those qualifications are the most essential qualifications in a foreman, and what you want, besides, in such a man is not book learning, but an intelligence sufficiently trained to be able to deal with new conditions, and an amount of knowledge sufficient to enable him to know where to go to find more if he wants it."

The Philadelphia Press says that a prospector sent out some months ago by the Russian Government with the object of gaining information relative to the working of the mines of Siberia, has, after visiting many mining districts in this country and Europe, advised his Government to purchase American machinery and adopt a very large number of the improvements in which, he says, American miners excel. The machinery purchased will be shipped from San Francisco to the mouth of the Amoor River, from whence it will be transported an average distance of 2000 miles into the interior of Siberia. Other orders are likely to follow.

Underground wires are a success in the District of Columbia. The wires were put down by the Standard Cable Company, of Pittsburgh, and the total cost for the 3 1/2 miles of cable laid was \$2145.47, about \$600 a mile. The cable used is the Warring cable, and it contains both electric and telephone wires. There has never been any difficulty experienced in working these wires from induction. This cable is so constructed that connections may be made with any of the six wires contained in it at any place desired. There is a lead covering around each separate conductor outside the insulator, and that covering takes up what would otherwise be an induction into the other wires and insulates it into the earth.

A number of new steamship lines are proposed in Hamburg, to connect with the new German colonies.







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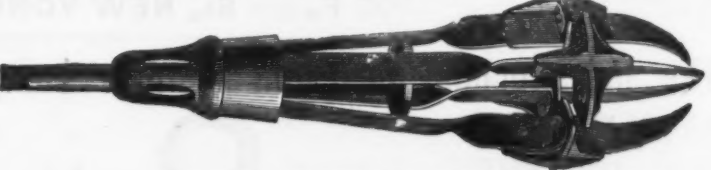
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**TRADE PUBLICATIONS.**

**Threshing Machinery.**

The thirty-fifth annual catalogue, just issued by the Pitts Agricultural Works, of Buffalo, N. Y., supplies a large number of illustrations, with accompanying descriptions, of their steam and horse power threshing machinery and Buffalo Pitts engines and boilers. The different parts of the machines are taken up in detail, and the materials of which they are finished and put in place, are dwelled upon at considerable length. Under the head of engines and boilers we find complete descriptions of the arrangement of their straw-burning engines, with tables of dimensions, and also short paragraphs devoted to computation and comparison of horse powers, long and short stroke engines, indicator diagrams and a large number of other particulars. As a means of giving prospective purchasers an idea of the character of their machinery the catalogue is eminently successful, and will undoubtedly be appreciated by those who propose making purchases in this line.

**Foot and Power Presses.**

The Ferracute Machine Company, of Bridgeton, N. J., have just issued two illustrated specimen sheets of their foot and power presses, dies and other sheet metal tools of all kinds. One of them, known as List 3, and dated January 1, 1885, illustrates a portion of the machinery shown in the illustrated pamphlet catalogue issued by the company, and describing 75 different kinds of presses, a great variety of dies and other small tools used in making tin boxes and canisters of any kind, besides other special machinery. This catalogue will be sent to any one who is interested in these kinds of goods and will apply for it. The second circular, List 4, is dated March 1, 1885, and, in addition to descriptive particulars of one of their power punch presses, give a list of extra appliances and a price list and table of dimensions. Both circulars will no doubt prove of a good deal of interest to sheet-metal workers.

**Grinding Machines.**

The Brown & Sharpe Mfg. Co., of Providence, R. I., have favored us with their recently-issued book on grinding machines, which, while not entering into minute details, gives a plain and comprehensive description of the construction and use of the universal grinding machine as built by them. It is replete with finely-executed engravings, and its value as a source of information on the subject cannot be questioned. Accompanying the book we find a small pamphlet on the universal cutter and reamer grinder made by them. This machine was designed to meet the requirements of tool-making and jobbing shops where a great variety of tools is to be sharpened. It is constructed with due reference to the application of any special fixture which may be required for grinding. Another catalogue treats of standard gears, to which we referred some time ago. Still another is of a general character, giving illustrations and brief descriptions, dimensions, &c., of the various appliances turned out in their works.

**Crushing Machinery.**

Messrs. Fraser & Chalmers, of Chicago, Ill., are sending out illustrated pamphlets devoted to the interests of their Sturtevant mill for grinding and crushing ores, phosphates, emery and other hard and refractory materials. The pamphlet supplies a number of different views, both general and detail, together with sufficient particulars to enable the reader to get a fair idea of its manner of working. One of these mills, we understand, has been running steadily for several months on copper matte at the Oreford Copper and Sulphur Works, near New York, and an experimental mill can be seen in this city, at the New York Ore Milling and Testing Works, at 528 West Sixteenth street.

**The Hotchkiss Mechanical Boiler Cleaner.**

Mr. James F. Hotchkiss, of 66 John street, New York, has just sent out new editions of his little book, "How to Keep Boilers Clean," which, besides containing the usual description and general and detail views of his well-known boiler cleaner, supplies a large amount of interesting information on boilers generally and boiler incrustations. The book has been considerably enlarged and will be found useful for reference in many cases.

**Drilling Machines.**

Messrs. Boynton & Plummer, of Worcester, Mass., have just sent out a new illustrated catalogue of their improved drilling machines, bolt cutters, &c. It is intended to take the place of all others heretofore issued, and illustrates and describes the various appliances in a very satisfactory way. Among the machinery illustrated we find different types of upright self-feeding drills, horizontal drills, bolt cutters, bolt cutting and tapping machines, tire benders, shrinkers, &c.

**Patents.**

Messrs. Frank Scheeby & Co., 709 Fourth street, N. W., Washington, D. C., have issued an interesting little pamphlet relating to American and foreign patents. While chiefly of an advertising nature, it supplies some interesting particulars on such questions as how to obtain a patent, methods of application, official examinations, designs, reissues, trade-marks and copyrights, &c.

**Fire Alarms.**

A neat little catalogue which has just been issued by the Lexington Manufacturing Company, of Lexington, Ky., supplies illustrations and particulars of what is known as the Lexington improved fire-alarm telegraph system for cities or factories. The engravings show different views of signal-boxes, electro-mechanical gongs, tower bell strikers, tappers, &c. In addition we find an interesting description and illustrations relating to the Lexington combination door

lock, which works without a key, is made on entirely new principles, and for which a number of important advantages are claimed.

**Special Machinery.**

Mr. J. Q. Maynard, 12 Cortlandt street, New York, has sent us a number of illustrated pamphlets devoted to the Wythe patent automatic safety hoist; engineers', machinists' and blacksmiths' tools, and other machinery specialties. A large number of illustrations, with accompanying descriptive particulars, price lists and tables of dimensions, are supplied, the whole forming a convenient collection of information for those who either contemplate making purchases in this line or who are interested in such appliances in a general way.

**The Dexter Folding Machine.**

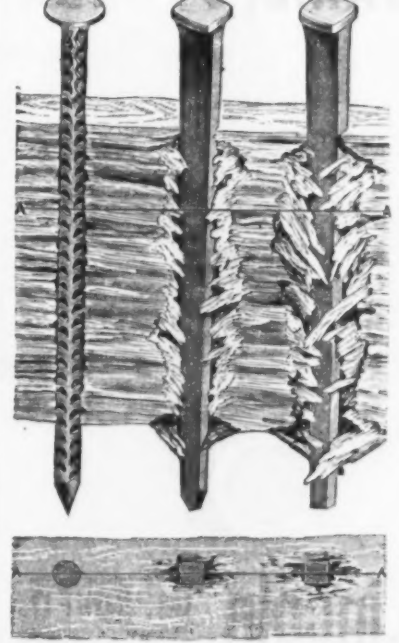
A well-arranged pamphlet illustrating and describing the above machine has just been issued by the Dexter Mfg. Co., of Des Moines, Iowa. The Dexter folder is claimed to have been the first and only successful folding machine ever placed upon the market for taking the place of the fly-table of the ordinary printing press, and the particulars furnished in the catalogue are thus of more than ordinary interest.

**Threshing Machines and Engines.**

The Westinghouse Machine Company, of Schenectady, N. Y., have sent us their new catalogue devoted to threshing machinery. It is fully illustrated, and supplies matter of unquestionable interest and value to the trade.

**Wire Nails.**

In a circular issued some time since by the HP Nail Company, of Cleveland, Ohio, there is presented an engraving showing the effect on soft wood of an ordinary cut nail with square point, also of a cut nail with a chisel point, and, in comparison, a wire nail. The illustration below, which is a fac simile will convey the idea to the reader's mind. We have examined the original block of wood from which this illustration was prepared, and can testify to the accuracy of the delineation. If there be any error at all, it is that the fractures of fiber with the cut nails are not shown as great as they are in reality. It will be noticed that the chisel-pointed nail does not fracture the wood as much as the blunt-pointed, whereas the wire nail, with sharp point and round shank,



The Effect on Wood of Nails of Different Shapes and of Different Kinds of Points.

cleaves the wood with scarcely any disruption of the fiber. One of the special advantages which wire nails possess over cut nails is herein strikingly illustrated. It is manifest, further, by the illustration that if one of the cut nails should be withdrawn halfway it would be so much loosened as to be comparatively easily removed. The taper of the nail is such that its efficiency is practically overcome the moment it is at all withdrawn from the furthest point to which it is driven. On the other hand, withdrawing a wire nail from the wood into which it has been driven has the effect of lessening its hold simply in proportion to the amount it is drawn out. The nail being of the same diameter throughout, the wood binds as closely upon such portions as remain after it has been partly withdrawn as at the outset. This fact, in connection with the advantage already alluded to, namely, that of not fracturing the wood, renders wire nails of decided advantage in house building over ordinary cut nails, and to this the company above mentioned are directing special attention. Although wire nails have been before the public for some time, they are yet a novelty to many builders, and this account of their advantages will be of interest. Less wire nails are required for the same strength, and smaller nails of the wire pattern are as serviceable as larger nails of the cut style. The advantage attending the use of wire nails has become so thoroughly understood and appreciated in Cleveland, Ohio, where these goods are largely manufactured, that we are informed that it is very common for real estate agents, in the enumeration of the advantages of certain pieces of property, to direct the attention of would-be purchasers to the fact that the woodwork in them is put together with wire nails. We understand that a building in which wire nails are employed commands a higher price than those of the same general style and quality put together with cut nails. Manufacturers who have goods to ship in cases are also beginning to appreciate the advantage of wire nails, and, accordingly, they are being largely employed in cases, packing boxes, &c.



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NOW, This is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,  
FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and  
SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1885.

WITNESSES—  
E. M. REED,  
(Attorney for Defendant.)

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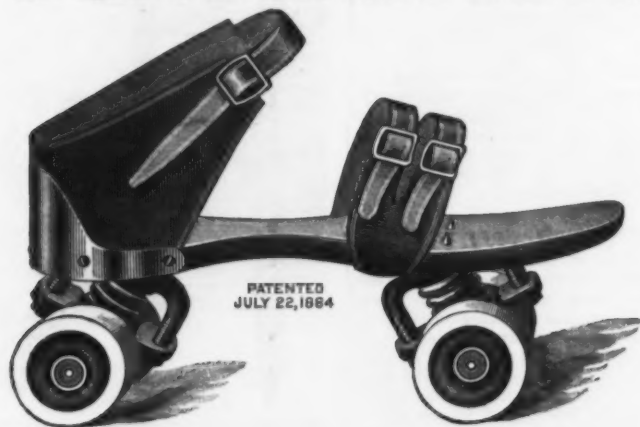
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H. B. NEWELL & CO.,  
105 Chambers St., New York,  
and 47 Pearl St., Boston, Mass.  
SAM'L G. B. COOK & CO.,  
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Baltimore, Md.  
HAMILTON & MATHEWS,  
77 Exchange St., Rochester, N. Y.  
BALL & WILLIS BROS. CO.,  
Cor. St. Louis Ave. & Santa Fe St.,  
Kansas City, Mo.  
J. M. WARREN & CO., Troy, N. Y.



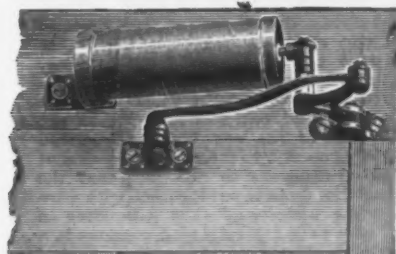
SAFETY BARB WIRE  
FENCE GUARD.  
PATENTED,  
MAR. 4TH 1884

(THIS CUT IS TWO-THIRDS OF ACTUAL SIZE.)

504 Commerce St., PHILADELPHIA, PA.

## THE SHAW DOOR CHECK AND SPRING.

GREAT REDUCTION IN PRICE.



The SHAW DOOR CHECK AND SPRING CO. have removed to their new factory, and with their increased facilities for manufacturing their goods have decided to reduce the price of each Spring \$1 from former list, and thereby bring the machine within the reach of all. The SHAW CO. are the owners of the oldest patented device for closing doors noiselessly, and with their new improvement produce the only check and spring which the trade can sell as general hardware. The same spring can be applied to either hinge or jamb side of both right or left hand doors.

SHAW DOOR CHECK AND SPRING CO.

MANUFACTURERS AND SOLE AGENTS,

Office and Factory, 164 High St., Boston, Mass.

BRANCH OFFICES: 77 Reade St., New York; 239 Lake St., Chicago, Ill.

## CORPORATE MARK.



Joseph Rodgers & Sons'

(LIMITED)

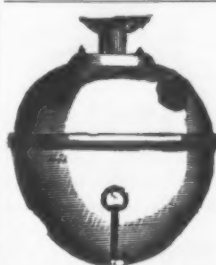
CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers' & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.



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Manufacturers of  
SLEIGH BELLS,  
House, Tea, Hand,  
Gong Bells, &c.  
Bell Metal Kettles.

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Stubs' Files, Tools and Steel, Grobet Swiss Files,

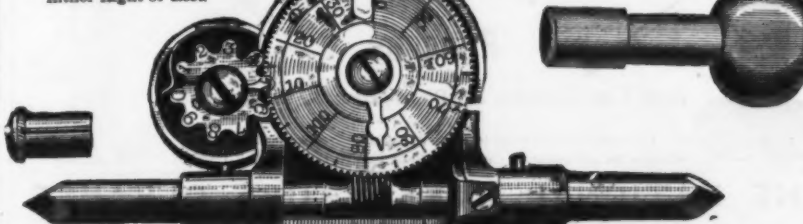
CHESTERMAN'S TAPES, RULES, ETC..

Hubert's French Emery Paper, Horseshoe Magnets, &c.

WM. SMITH & SON'S CELEBRATED MUSIC WIRE, Nos. 2 to 30.  
French Sheet Steel, 3 1/4 in. wide, from 4 to 65 thousandths.

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PATENTED IMPROVED  
Double Speed Indicator.  
Either Right or Left.



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NO SOLDER.

THE BEST AND CHEAPEST.

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Wherever Introduced.

TWO SIZES: { No. 1, holding 8 Pints.  
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TAYLOR & BOGGIS FIDY CO.,

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Sample sent you if desired.

Will Sell Any Goods in Stock at Cost and Less than Cost.

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Breech and Muzzle Loading Guns; also cheap grade Revolvers. Send for quotations.

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Spilers, Agent for Raymond's American Crane

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Manufacturers of

THE GENUINE

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Screw

Wrenches.

PATENTED,

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The back strain when the wrench is used is borne by the bar—not by the handle.  
The strongest Wrench made, and the only successful Re-enforced Bar.  
None genuine unless stamped

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Our Agents, JOHN H. GRAHAM CO., 111 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

## HILL'S CHAMPION DRYER.



BEST  
AND ONLY  
SELF-FASTENING  
Clothes Dryer  
IN USE.

Patented in United  
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Three Sizes, 100 to 150 Feet of Line.

ALSO MANUFACTURERS OF

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For Illustration see last issue of Iron Age.

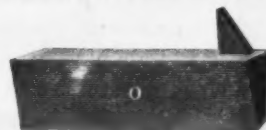
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Toe Calks.



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Superior Design. Unrivalled Work-

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Manufacture Safety and Guard Harness Snaps  
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Rope Goods for horses and cattle, Breast Chains  
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Shipman's Steam Engines,

And the following Specialties: Coopers' and Slaters  
Tools, Solid Cast Steel Pump Augers and Reamers.







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Manufacture the Largest Variety of Forged Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

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BLOOMS, SLABS AND BILLETS,  
Rolled and Hammered.

HOMOGENEOUS STEEL BLOOMS,  
FOR BOILER PLATE.

BLOOMS AND BILLETS,  
For Nails, Wire, and Bridge Bars.

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OF ANY REQUIRED PATTERNS.

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Hammered and Rolled.

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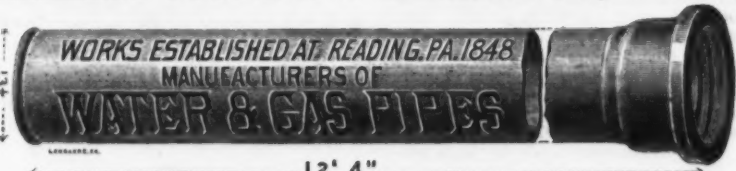
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in finish. Prices as low as for Inferior Work.

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SPECIAL CASTINGS, such as Branch Pipe, Bends, Reducers, Sleeves, Curves, &c. STOP VALVES for  
Water and Gas from 2 to 48 inches in diameter. FIRE HYDRANTS, RETORTS, and LAMP POSTS. FLANGE  
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Of Every Quality and Description.

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Every quality.  
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My friends will do themselves a favor by corresponding with me for  
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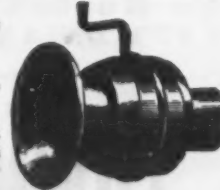
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Note the changes that occur in this space weekly.



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21 & 23 ANN STREET, NEW YORK,  
Manufacturers of  
SPEAKING TUBES, WHISTLES, ELBOWS, ORAL ANNUN-  
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Horse, Mule & Snow Shoes of the Perkins Pattern.

Works at Valley Falls, R. I.

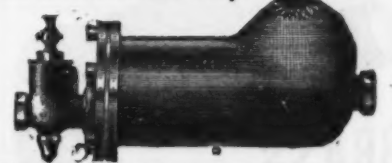
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Has automatic air discharge; has a differential open-  
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Is very accessible for cleaning, the valve being on the  
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Send to nearest office for circular.

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HARDWARE,

165 GREENWICH STREET,

Agents for the Philadelphia Star Carriage and Tire Bolts.



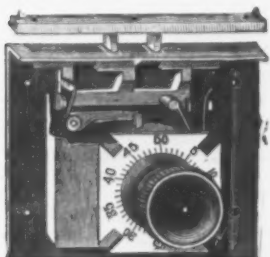
John McLean,  
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Stop Cocks & Galvan-  
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### COLD ROLLED

STEEL AND IRON  
Figures, Letters, Stamps  
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SEND FOR CIRCULAR.  
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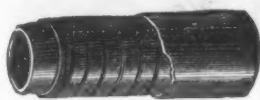
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FOR ALL PURPOSES.  
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FOR

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Chain Pump Tube, Curbs, &c.

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Manufacturers of

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ESTABLISHED 1839.

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Manufacturers of  
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Hawking Beets, Hawking and Calking Irons;  
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COTTON AND BALD HOOKS.  
Patented Feb. 13, 1877; a new combination of Hooks.  
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**\$50 REWARD**  
will be paid for any Grain  
Fan of same size that can  
clean and bag as much Grain  
or seed in one day as our  
Patent MONARCH Grain  
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Bagger, which we offer to  
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Send for Circular and Price  
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The Bolton Steel Co.  
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# Tool Steel CAST STEEL

And Other Fine Grades of

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ACME MACHINE & COMPANY,  
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By using my Phosphor Tin, manufacturers can  
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themselves, by the simple process of melt-  
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IRON AND BRASS  
Gimlet-Pointed Wood Screws.  
WRITE FOR DISCOUNT.

# Vulcanized Rubber Fabrics

ADAPTED TO  
MECHANICAL PURPOSES.

## RUBBER BELTING and PACKING.

Machine Belting,  
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Leaking Hose,  
Suction Hose,  
Grain Elevators,  
Steam Hose,  
Piston Rod Packing,  
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Vacuum Pump Valves,  
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Wagon Springs,  
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Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators, at Chicago, which have been running perfectly for more than twelve years; also those for the great Elevators of the Penna. and Erie Railroads, of Jersey City and Hoboken; Dow's Stores, of Brooklyn, and many others—in fact, the largest Belts for the largest Elevators in the world.  
A single carrier belt in the Penna. & E. R. Elevator is over 2000 feet long, weighing 18,000 pounds, and has run perfectly from the start.

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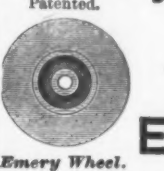
"TEST" HOSE.

Plain and Rubber Lined.  
Circular Woven Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c.



"CABLE" ANTISEPTIC.

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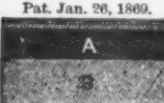
Emery Wheel.

ORIGINAL  
Solid Vulcanite  
EMERY WHEELS  
LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.



Section of Emery Wheel showing Iron Center.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing Wrought and Cast Iron, Hardened Steel, Slate, Marble, Glass, &c. These Wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small Machinery of almost every description.



RUBBER MAT.

**PATENT ELASTIC Rubber Back Square Packing**  
BEST IN THE WORLD  
For Packing the Piston Rods and Valve Stems of Steam Engines & Pumps.



RUBBER MATTING.

B represents that part of the packing which, when in use, is in contact with the piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam-tight and yet creates but little friction.  
This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

## Corrugated Rubber Mats and Matting.



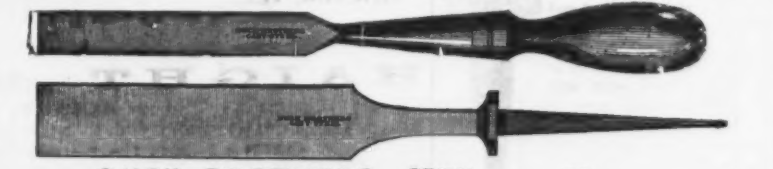
RUBBER MAT.

This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address



RUBBER MATTING.

**NEW YORK BELTING & PACKING CO.,**  
Warehouse, 15 Park Row (Opposite Astor House), New York.  
Branches: No. 308 Chestnut Street, Philadelphia; 151 Lake Street, Chicago; 53 and 54 Summer Street, Boston.  
**JOHN H. CHEEVER, Treas. JOHN D. CHEEVER Dep. Treas.**



**BUCK BROTHERS, Millbury, Mass.**  
The most complete assortment in the U. S. of  
Shank, Socket Firmer and Socket Framing Chisels.  
**PLANE IRONS.**  
CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also "Riverlin Works."

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—FOR—

BEARINGS, SLIDE VALVES, CYLINDER RINGS, CROSS-HEAD GIBS, STEPS, BUSHINGS,

And all purposes where Maximum Durability, Anti-Frictional and Non-Cutting Qualities are Desirable.

**PUMP RODS, BOLTS & NUTS, MACHINE and WOOD SCREWS, &c., &c.**  
Combine Toughness, Strength, Durability and Resistance to Corrosion.



TRADE MARK  
"Phosphor-Bronze."  
CASTINGS OF ALL KINDS TO ORDER.  
SEND FOR PAMPHLET AND PRICES.

**THE PHOSPHOR-BRONZE SMELTING CO., LIMITED.**  
No. 512 Arch St., PHILADELPHIA, PA.  
Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the U. S.



**DROP FORGED.**  
**MERRILL BROS., 26 First St., Brooklyn, E. D., N. Y.**

# English Letter.

(From Our Regular Correspondent.)

LONDON, March 30, 1885.

## THE SITUATION

is still one of uncertainty, tempered and flattened by the actualities of warfare on our own part in the Soudan, and on the part of the French in China, while the complications with Russia on the frontier of Afghanistan are so formidable that war with that power is regarded as being almost inevitable. As I have taken occasion to remark in a former letter, nobody in this country desires a war with Russia, but there can be no doubt whatever that there is yet "a good deal of devil" left in us, and if Russia persists in pursuing a course which clearly threatens India, then we, as a nation, shall oppose her, and shall "fight it out on that line" as long as we have a little finger left to wriggle in the face of the foe. All the same, we modern Britishers do not regard war with favor, save in self defense, and the majority of us are heartily sick of the "military operations which are not war" in Egypt, just as we hope that an amicable arrangement may be made with Russia even at the last moment. Our trade is in a very depressed condition in almost all its branches, and the ramifications of our commerce and shipping are such that we could not possibly engage in hostilities with any power without doing ourselves a great deal of harm. With Russia against us it is possible, also, that we should immediately feel the pinch in the shape of an advance in the price of breadstuffs, seeing that, with Russian wheat supplies cut off, your clever manipulators would be pretty certain to run up prices, and would have every encouragement to corner us on this prime necessity of existence. Luckily, we are not now so dependent on Russia for wheat as we were in 1853-55, so that we need not fear that flour should again reach 6/ or 7/ 7/ stone, as it did during the Crimean war.

You will gather from this that matters with us are not lively, yet as a faithful chronicler I am bound to say that the great military and naval preparations are giving a marked fillip to various branches of the iron and hardware trades. The Government are throwing away money with both hands, as the phrase goes, and are preparing for war on a most extensive scale should the emergency unfortunately arise. For the Suakim-Berber line more pumps—English this time—have been ordered, pipes and tubes are being manufactured, and rails, sleepers, bolts and nuts, engines, rolling stock, signals, lamps, tanks, cisterns, wire and sundries are being shipped in hot haste to the Red Sea. The ironclads and other naval requisites are being pushed on night and day, rifles and ammunition, powder, bullets, cartridges, saddles and harness, knives, bayonets and all the paraphernalia of the land and naval services are being piled up in enormous quantities. So far we are benefited, and those who have obtained their shares of the orders are probably very well satisfied with the turn affairs have taken. It is also understood that the majority of our farmers favor a war with Russia. They did so well in 1853-55 that they look forward to a repetition of those "good old times," and would like to see corn at fancy prices, so as to recoup themselves for some of the losses of the past few years. Certain speculators on the exchanges would also favor a war, either with Russia or any other country, simply because there would then be violent and rapid fluctuations, amid which gamblers might hope to make more money than is generally obtainable in the "piping times of peace." All this is deplorable, of course, but there is "much human nature" in most of us, and it is probable that few men are strong enough to remember "the greatest good of the greatest number" when self-interest leads in another direction.

## THE IRON MARKET

has been very quiet this week, and there is exceedingly little that is new to note in connection with any branch of the trade. At Glasgow warrants have been devoid of animation, and have not undergone any variations in value of moment, the closing price being 41/5 7/ ton. Scotch makers' brands are unchanged, and the market generally is dull, the statistical position being of a nature by no means calculated to encourage optimistic views. Stocks are rapidly growing, and will soon be on a par with those of a year ago, while shipments are still on a poor scale as compared with those of the corresponding period of last year. At Middlesboro' pig iron is lethargic, and the present situation is in no way brightened by the outlook. For No. 3 the quotation is about 34/ in second hands, and 3d. @ 6d. more from makers. The local consumption continues relatively small, and shipments are not above an average. Whitwell & Co., Stockton, have altered their prices for "Thornaby" hematites to 47/6 for No. 1 Bessemer and 45/6 for No. 3, both net cash on trucks at the works. On the West Coast hematites are fairly steady, mixed lots in usual proportions being about 44/ for prompts, and 44/6 @ 45/ for three to six months' deliveries. The "Ulverston" brand, which is sold direct, is now quoted at 47/6, 46/6 and 44/6, less 2 1/2, for Nos. 1, 2 and 3 Bessemer respectively, all free on trucks or f.o.b. at Ulverston. In other districts values are unchanged, and the general demand is also about the same as it has been of late, although the close of the quarter has the natural effect of rendering both vendors and buyers chary of moving on a large scale. In heavy manufactured iron there is a fair turnover, with the exception of iron ship plates. A good deal of bridge, roofing, dockyard and general engineering work is in hand in different parts of the country, and at Sheffield the armor-plate departments are tolerably active on the orders of the home and other Governments. In fencing wire there is no change to note, the demand being poor, and prices are cut so fine that some of the makers are what is tersely termed "out of it." Galvanized iron is quiet, albeit values are rather steadier. The combination in the bolt and nut trade still attracts attention, and there is some comment in connection with the fact that special quotations are continued for buyers in Scot-

land, as well as for shipbuilders, railways, wagon-makers and other large consumers. In the ordinary branches of the iron trade there is nothing moving; indeed, some of the current reports from the large centers speak of increasing dullness and lessened occupation at many of the mills and forges. All quotations are quite nominal at recent figures. For old materials there is a rather better inquiry from the United States, and slightly higher prices are offered for old rails and scrap, c.i.f. New York. I quote: Old double-headed iron rails, £2. 12/6 @ £2. 15/; No. 1 heavy wrought scrap, £2. 2/6 @ £2. 5/; old boiler tubes, £2. 2/6 @ £2. 5/; old cast iron, £2 @ £2. 5/; and old leaf-spring steel, £2. 7/6 7/ ton, f.o.b. London or other good British port. Freighters are inclined to go up, the rate for pig iron by ordinary steamers from Glasgow to New York being 2/ @ 2/6 7/ ton. Liverpool rates to Transatlantic ports are also slightly firmer, but there is no change from the Bristol Channel, owing in part to the starting of a new line thence. Eastern and Australian freights are steady. Steel is about the same as of late, with a very quiet ending of the quarter in most cases. The Bessemer concerns are not quite so well engaged, but the producers of mild steel are all doing a considerable turnover. Steel rails are as of late, at £4. 15/ 7/ ton for ordinary heavy sections, and other weights, &c., *pro rata*. There is only a modest amount of new business moving, and much of that is for tramway and other light sorts.

## SCOTCH PIG IRON

is very quiet, and the speculators in warrants have no chance of making other than most nominal margins so long as the political situation remains so complicated. The bulls have tried to score by starting a rumor that a number of furnaces were to be blown out, but the device fell flat and no tangible result accrued. At present there are 92 furnaces in blast in Scotland (one having been stopped at Glenarnock, while the one damped down at Dalmeilington has been restarted), as against 93 a year ago. In Connal's stores there are 591,716 tons (an increase for the week of 171 tons), compared with 594,490 tons this date 1884. Shipments to date are 23,321 tons, or about 10 per cent. behind, while the importations of Middlesboro' pig iron into Scotland have increased by 30,592 tons, or nearly 47 1/2, this year. Current quotations are:

Deliverable alongside.	No. 1.	No. 2.
Gartsherrie, at Glasgow.....	51/3	46/6
Coltness, ".....	51/6	50/6
Langloan, ".....	51/	50/1
Summerlee, ".....	51/	46/
Calder, ".....	52/	46/6
Carnbroe, ".....	48/6	46/
Clyde, ".....	46/9	42/9
Monkland, ".....	42/3	40/
Quarter, ".....	41/6	39/6
Govan, at Broomielaw.....	42/	40/
Shotts, at Leith.....	51/	50/6
Carron, at Grangemouth.....	52/6	47/
Kinnell, at Bo'ness.....	44/	43/
Glenarnock, at Ardrossan.....	48/6	43/
Eglinton, ".....	43/	39/6
Dalmellington, ".....	47/	43/

## MIDDLESBORO' PIG IRON

remains very flat, and is especially so in view of the circumstance that a rupture with Russia would cause a serious and direct loss to the shipping trade of the North of England. The local consumption of pig iron is moderate only, although some of the shipyards are becoming busier. For No. 3 34/ @ 34/3 is the quotation, and G. M. B. are:

No. 1 Foundry.....	37/6	Mottled.....	32/9
" 2 ".....	36/	White.....	32/6
" 3 ".....	34/3	Refined Metal.....	50/
" 4 ".....	33/6	Kentledge.....	36/6
" 4 Forge.....	33/3	Cinder.....	31/

## HEMATITE PIG IRONS

are fairly steady, and would probably harden were the general outlook at all of a reasonable nature. As it is, mixed lots are 44/ or so 7/ ton, and West Coast makers' brands are:

	No. 1.	No. 2.	No. 3.
Cleator.....	45/6	45/3	45/
Lonsdale.....	44/9	44/3	43/9
Workington.....	44/6	44/	43/6
Lowther.....	44/6	44/	43/6
Distington.....	44/6	44/	43/6
Harrington.....	45/	44/6	44/
Solway.....	44/6	44/	43/6
Maryport.....	44/6	44/	43/6

## TIN PLATES.

In London the business is reported to be fairly good and the market may be described as, on the whole, pretty steady. Bessemer and Siemens coke squares have been in special request, and a tolerably good business has resulted at 14/1 @ 14/3 for the latter and 13/9 @ 14/ for the former, both f.o.b. Liverpool. At Liverpool the best feature about the tin-plate market this week is that there has been a trifle more doing, and what is more to the purpose as regard steadying the market, there has been no pressure of plates put on nor any forced sales made. Though things generally are no doubt extremely quiet, as is usual just before the quarterly meetings, the tendency in this market is toward recovery. There has been a great absence of business in cokelets for some time past. Very many of the parcels offering were snapped up promptly, and some forward business is still pending, the result of the inquiries sent out not being yet known; 13/6 IC for common grade cokes, and 13/9 @ 14/ IC respectively for ordinary and good brands, are the ruling figures. Of course if the good or better class brands could be had at 13/6 there would be a big business doing at once. But there are not many anxious sellers just yet, and very many makers have full order books, for short periods at any rate. Coke-tin wasters are in fair demand, but only very good brands fetch 13/ @ 13/3 now. Some of the commoner sorts are selling at 1 1/4d. @ 3d. less. There is certainly more doing also in steels with coke finish this week. There are numerous inquiries for the better qualities, such as Siemens steel plates and for Bessemer's second quality, perhaps more for the latter than the former, though the orders for Siemens are for the better sorts, being well-assorted specifications. All spot parcels of certain sizes in Bessemer are picked up with promptitude, and some orders have been placed for delivery at the end of this month and early next month at 13/9 @ 14/3. There is not much, if any, change to report in charcoal and best charcoal tin plates, orders for which are still scarce, while prices are pretty much as they were. The same thing may be said about ternes, for which there seems to be a decided falling off.



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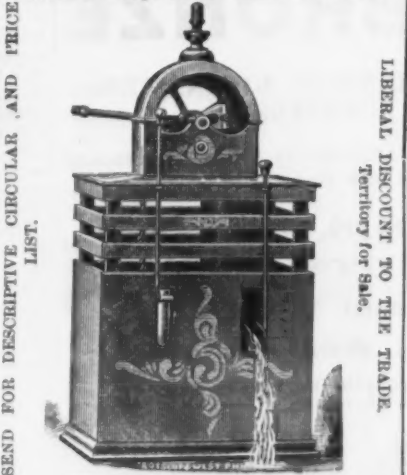
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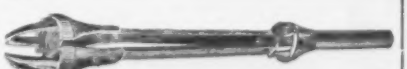
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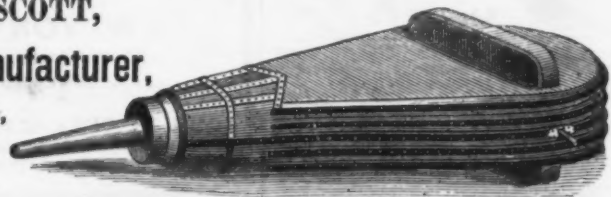
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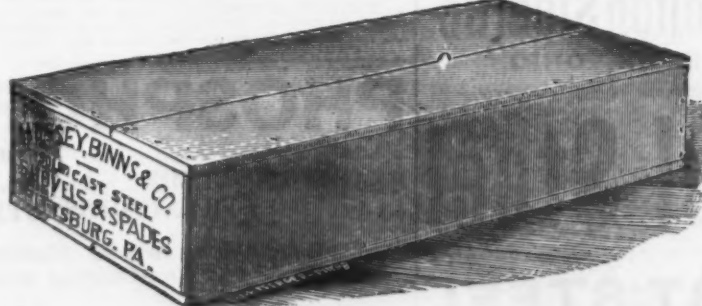


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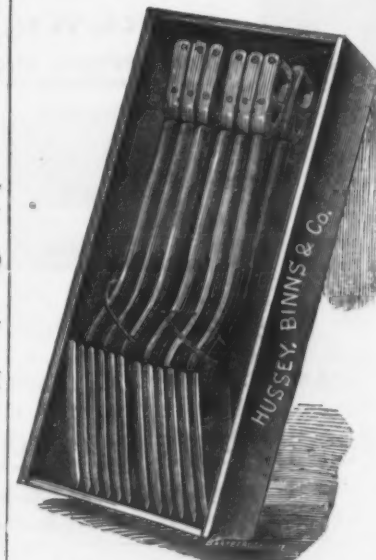
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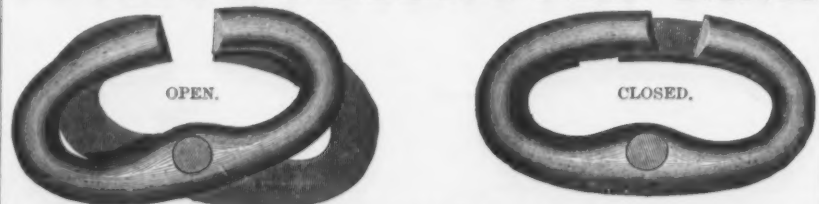
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### Submarine Tunneling.

Those interested in matters pertaining to the construction of submarine tunnels will find several features worthy of attention in a method recently brought out by Mr. Hayden H. Hall, of New Hamburg, N. Y., and designed for laying submarine tunnels and tubes rapidly without the use of compressed air. The apparatus which Mr. Hall has patented consists in the main of a movable caisson provided with a prow and means for attaching a draft chain or cable at one end, and at the opposite end with a neck adapted to receive the end of the tunnel tube, the caisson, further, being supplied with an air-shaft or hatchway extending above the surface of the water. Our engraving, showing a section and elevation, very clearly explains the arrangement adopted. The method of constructing a tunnel may be briefly described as follows:

If the banks of the river or other channels to be tunneled are abrupt, and if the tunnel, on account of its height, would obstruct navigation, it would be necessary to cut a ditch or channel so as to sink the tunnel below the river bed, and also to cut a channel inland to meet railroad track or other roadway. The caisson is then launched and floated into the ditch, with the neck projecting inland, the lower edge of its opening on a level with the water. The first length of the tunnel is then constructed, consisting of six segments 10 feet long and 8 feet wide, bolted together by means of inner flanges, leaving the outer surface of the tunnel perfectly smooth, with its end projecting a short distance into the caisson. The next length is then put together inside the caisson, the caisson is drawn forward ready to receive the next length, and so on till the tunnel is completed. For excavating channels for tunnels and leveling river-beds the ordinary dipper or clam-shell dredge may be used. The caisson is constructed of wrought iron or other suitable material, the bow being shaped like a double mold-board plow, which serves to level its way after the dredge. The opposite end has a stuffing-box to receive the tunnel. Through the bottom of the caisson are heavy anchoring piles which hold it in place while each section of

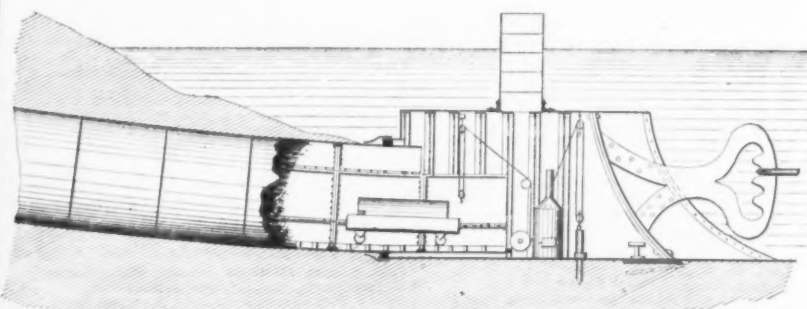
way interested in the progress of electrical science and in its various applications to the useful arts.

**STEAM-MAKING, OR BOILER PRACTICE.** By Prof. Charles A. Smith. Size 6 x 9 inches, 195 pages. Published by the American Engineer.

Those in search of an interesting presentation of modern boiler practice will find the above work to meet their requirements in a very satisfactory manner. The examples of boilers are taken from American practice where possible, and a large amount of valuable data has been collected from different sources and suitably classified. The book is divided into eight chapters, treating successively of heat and the properties of steam; combustion; externally and internally fired stationary boilers; internally-fired portable, locomotive and marine boilers; the design, construction and strength of boilers; and an account of miscellaneous boilers and on choice of fittings and appurtenances. As few good works on boilers are now available, the book will prove a welcome source of information in many quarters, and its reception cannot be but favorable.

**LOCOMOTIVE ENGINE RUNNING AND MANAGEMENT.** By Angus Sinclair. Size 5 x 7 1/4 inches, 390 pages. Published by John Wiley & Sons. Price, \$2.

We have read Mr. Sinclair's book with a good deal of interest, and those who will examine it will undoubtedly agree with us in pronouncing it as in every way a most desirable and valuable addition to the scant literature of the subject. Not only is the matter arranged conveniently and in an attractive manner, but Mr. Sinclair has adopted a peculiarly happy method of treatment which cannot fail to make the work popular. It is elementary throughout, and the problems introduced are disposed of in as simple a manner as possible, so that the practical locomotive engineer, for whose benefit it is specially intended, can go through page after page without encountering any discouraging mathematical manipulations or highly theoretical discussions. Probably the best idea of the arrangement of the matter can be given by quoting the titles of some of the chapters. Thus Chap. I treats of "Engineers and Their Duties;" Chap. II,



Submarine Tunneling.

tunnel is being put together. Hydraulic jacks are used to move the caisson forward. On the top of the caisson, as shown, is a ventilating tube which projects above the surface of the water. As the caisson is drawn forward into deep water, ballast is added in sufficient quantities to hold it firmly down in the channel, and as it proceeds to the opposite shore the ballast is gradually relieved. Within the caisson is an engine for operating the ropes or chains of a traveling crane which is used to raise and place in position the tube sections. The anchoring piles can be raised or lowered by tackle suspended from the top of the caisson. A plate with a small screw shaft is hinged to the bottom of the front part of the caisson, as shown, and may be raised or depressed, so as to partially regulate the direction of travel of the caisson.

Mr. Hall proposes to use a low-cost non-corrosive metal for his tunnel sections, the metal to be cast in specially arranged adjustable molds. As to cost of construction, he claims that a double railway tunnel, 18 feet feet in diameter, can be built at a lower cost per foot than an ordinary bridge for the same purpose.

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### NEW PUBLICATIONS.

**ELECTRICITY AND THE ELECTRIC TELEGRAPH.** By George B. Prescott. Two volumes. Size 5 1/2 x 8 1/2 inches. Vol. I, 602 pages; Vol. II, 1120 pages. Published by D. Appleton & Co. Price, \$5.

The sixth edition of the above work, which was issued a short time ago, has been revised and enlarged, making it of even greater value than heretofore to those engaged in the different branches of telegraphic service. Mr. Prescott's object has been to furnish a treatise on the subject of electricity and the telegraph which should present a comprehensive and accurate summary of the present advanced state of the science and art both in this country and abroad, and the two volumes, as may well be imagined, are consequently of considerable interest both from historical and practical points of view. Special attention has been paid to the voluminous contributions of Germany, and a good deal of information heretofore for the greater part unknown to the English reader is thus supplied. The discoveries, inventions and practical improvements of the past few years, especially those relating to the duplex and quadruplex methods of transmission, and to the improved type-printing apparatus, are described and illustrated with a completeness commensurate with the great importance of the subject. The value of the descriptive portion of the work has furthermore been greatly increased by the introduction of numerous original illustrations, which have been freely employed whenever they could be made to serve a useful purpose in the elucidation of the text. In its present shape the work will be found of a good deal of value, not only to the professional telegrapher, but to all who are in any

of "How Locomotive Engineers are Made;" Chap. III, "Inspection of the Locomotive;" Chap. IV, "Getting Ready for the Road;" Chap. V, "Running a Fast Freight Train;" Chap. VI, "Getting Up the Hill," &c. Though, as Mr. Sinclair states, the original intention was to publish a book on locomotive-engine running alone, the clearly apparent demand for plainly-given information relating to numerous operations connected with the repairing and maintenance of locomotives gave rise to several chapters on valve motion, and these will, without doubt, be highly appreciated. Everything that a locomotive engineer or fireman should know so far as the engine and its connections are concerned, is included, and the book is by far the most interesting and valuable one of its kind that we have yet had occasion to examine.

**TUNNELING UNDER THE HUDSON RIVER.** By S. D. V. Burr. Size 9 x 11 1/4 inches, 70 pages. Published by John Wiley & Sons. Price, \$2.50.

Probably few of our readers have not heard of the Hudson River tunnel project, which was a matter of general interest for several years. The general plans, according to which a short length of the tunnel was built, were new, introducing novel methods of working, and Mr. Burr's detail descriptions of the different stages of the work, together with finely-executed working drawings, are thus well calculated to attract attention and well-merited, favorable comment. Mr. Burr's opportunities for close and careful inspection were most favorable from almost the beginning of the enterprise, and his collection of matter is accordingly of much greater value than would otherwise have been the case. There are 27 plates, furnishing excellent illustrations which may be accepted as thoroughly reliable and exact, and which, in connection with the text, are of the greatest value, indicating what was contemplated, what has thus far been actually accomplished and showing the manner in which the various and numerous obstacles encountered were overcome.

**A HANDBOOK ON THE TEETH OF GEARS.** By George B. Grant. Size 5 1/2 x 9 1/4 inches, 39 pages. Price, \$1.

Mr. Grant's little book treats of the form of the gear tooth, explaining the different curves in use, their theory, peculiar properties, construction, &c. The epicycloidal form of tooth is treated of at some length, and its construction, defects and merits are discussed. Different forms of odontographs are described, and convenient rules and tables directly relating to the subject are supplied.

During the month just past 22,192 immigrants were landed at Castle Garden, a decrease of 6769 as compared with the figures for the same period last year. For the quarter 33,900 immigrants were landed, against 49,652 for the first three months of 1884, a decrease of 15,752.

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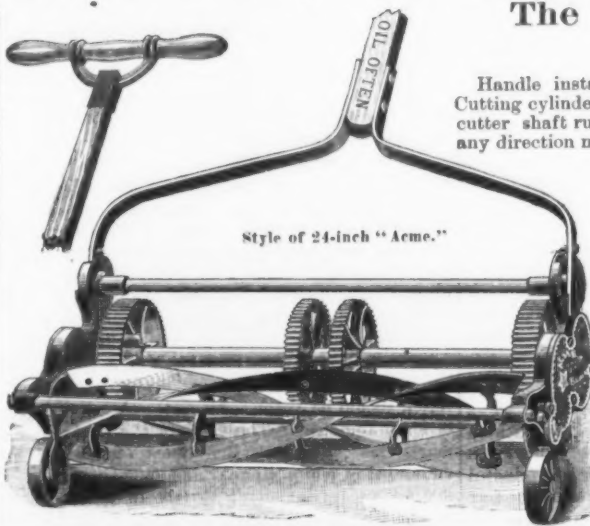
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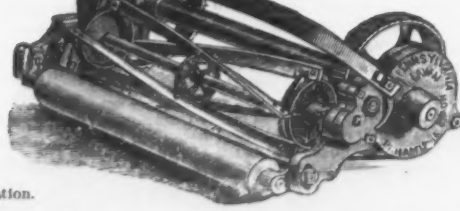
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AND  
Metallurgical Review.

New York, Thursday, April 16, 1885.

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### New Points Relative to Trade-marks.

There is no doubt that trade-marks are valuable properties and becoming more and more valuable every day. There are many large manufacturing companies and firms in the United States which expend thousands of dollars annually in defending their rights to trade-marks claimed by them. A well-known manufacturer of starch, in New York, employs able counsel whose exclusive business it is to look after the trade-mark interests of the company. With the increase of population, wealth and purchasing power, articles which are by no means necessities, as well as those which may be so regarded, attain to enormous sales, and the distinguishing mark or name by which such articles are known constitute in great part the value of the business.

Within the last two years there have been many cases decided in the courts which, while establishing few new principles of first importance, are interesting from the fact that they show the improvement of the law on this subject, and point out with great accuracy what constitutes and what does not constitute a good and valid trade-mark. In 1883 the English Parliament passed the Trade-marks act, which defines—a thing which unfortunately has not been attempted in this country—what a trade-mark may be. The provisions of the act are as follows:

(a) A name of an individual or firm printed, impressed or woven in some particular and distinctive manner; or

(b) A written signature or copy of a written signature of the individual or firm applying for registration thereof as a trade-mark; or

(c) A distinctive device, mark, brand, heading, label, ticket or fancy word not in common use, and there may be added to any one or more of these particulars any letters, words or figures, or combination of letters, words or figures, or any of them.

Although this is an English statute, it states substantially the condition of our law at the present time, though an American

Legislature would probably modify some of the provisions if called upon to regulate the subject. The former leading rules of law on trade-marks have not been changed. It is still true that a mere word in common usage descriptive of the quality or composition of the article cannot be made the subject of a trade-mark. The English language cannot be appropriated in that way, nor can a foreign word of description, particularly if it is well known. A fancy word, however, whether English or foreign, is allowable. A recent English case decides that a single letter cannot be registered. But initials arranged in an artificial way, or even the initials of a name, as "H. H. C." or "M. C.," are good trade-marks. Every person is entitled to use his own name or script signature, and he can transfer this right to an assignee or purchaser of the business. Neither he nor his assignee, however, can prevent another person having the same name from using the name as a trade-mark on similar goods, though if an extra device were also imitated he might restrain the use of the device. But the owner of a trade-mark cannot transfer it or the right to use it to another person without also transferring the business; at least he cannot do this so as to give the assignee the right to restrain others. The right to the exclusive use of a word or symbol as a trade-mark is inseparable from the right to make and sell the commodity which it has been appropriated to designate. It has been held within a few months that the name selected as a trade-mark need not be the name of the actual manufacturer of the goods to which it is attached, for the mark may in course of time become the property of the person who purchases the good-will. It has also been decided that a trade-mark will pass under a general assignment or conveyance of all the assets and effects of a firm, though not specifically designated—that is to say, the original owner would no longer have the right to use it, while the assignee would obtain the exclusive right. An assumed or fictitious name may constitute a valid trade-mark provided there is no attempt to deceive or to induce purchasers to believe that the article is manufactured by some person bearing that name.

The best kind of a trade-mark, as is shown by the late decisions, is that which specifies the name of the place where the article is made, or consists of a fanciful name or device. Thus, a certain coal had acquired a reputation in the London market as "Lochelly Coal." There was another seam of coal in the same locality, and the proprietors of this seam began to sell this last coal under the name of "Lochelly Splint Coal." They were restrained from using the word "Lochelly." The manufacturers of certain compounds sold them under the name of "Angostura Bitters." Angostura being the name of the place where the bitters were made. This was held to be a good trade-mark in an English court, and the defendants were restrained from the use of the word "Angostura." But a case in the Court of Appeals of Maryland, in which the same parties owning this trade-mark were endeavoring to obtain an injunction, was decided against them because of misrepresentations in the label, which vitiated a trade-mark otherwise good.

Some question has arisen recently in regard to the right of employees or partners who leave the firm and set up a separate business of their own to use the phrase, "Late with the firm of —." It is decided in England, and it doubtless would be so decided here, that the old firm cannot restrain or prevent this use. But in one case the sign and letter-heads contained the name of the new concern in very small letters, followed by the phrase, "from Thresher & Glenn," the word "from" being also very finely printed, but the words "Thresher & Glenn" very prominent and striking. This was regarded as evincing an intent to deceive, and was therefore restrained by injunction.

Words of quality or description, as is well known, cannot be made the subject of a trade-mark. The words "superfine," "superior," "nourishing," cannot be claimed, but "Excelsior" can. The mere name of a product cannot be appropriated, but the words "silicon," and "electro-silicon" are not in a scientific sense descriptive of the article thus designated, although silicon is one of its component parts, the article being a white powder sold and used for polishing metals. Therefore they are valid as trade-marks. The word "snowflake," as applied to crackers is a mere descriptive phrase, of appearance or quality, and so cannot be claimed. The name "Hostetter's Stomach Bitters" cannot be a good trade-mark, but being used in connection with bottles of a certain size, color, shape and material, and a peculiar label, all together constitutes a valid trade-mark, the imitation of which may be enjoined. It was recently decided in the case of Lorillard against the Drummond Tobacco Company that such a simple and ordinary device as a horseshoe alone cannot be claimed as a label, nor can one man appropriate as a trade-mark an ordinary and usual form of package and fashion of label, so as to exclude others from the use of a similar article; the mere idea, represented by a figure on an article sold for the polishing purposes, that it will make things bright enough to be used as mirrors cannot be the subject of a trade-mark. The words "Eureka," "Pain Killer," "Licensed V. C. tualier's Relish," "Guinea Coal Company," have been protected lately, but the courts

have refused to protect the word "colonial." It has been said that while the word "original" is in common usage, yet, as taken in connection with any particular article, only the original inventor or manufacturer or their assignees have the right to use it.

A manufacturer who purchased of an inventor the exclusive right to work and sell a patented device called the "taper sleeve pulley" within a specified territory adopted as a trade-mark the term "Taper Sleeve Pulley Works." Another manufacturer purchased the right to manufacture the same article within certain other territory, and assumed the same trade name as the other manufacturer. It was decided that he had no right to assume the trade name and could be restrained from using it. An interesting case has been decided in regard to a patented article, where frames for sewing machines, in the form of the letter G, have been so extensively manufactured and sold by the inventor during the time they were protected by patents that the machines containing this feature came to be known in the trade thereby. After the expiration of the patents the patentee cannot, by claiming such form or shape of frame as a trade-mark, prevent others from using such frames in sewing machines manufactured and sold by them. The case of the Collins Company against Oliver Ames & Sons presents a feature of great importance and value. Collins & Co. manufactured edge tools which they marked with the firm name as a trade-mark, and they soon acquired a reputation among the trade. The defendants manufactured shovels and marked them with the name "Collins & Co.," and sent them to Australia. Collins & Co. had a market in Australia and were well known there, but they had never manufactured or sold shovels there or elsewhere. It was to be inferred that the defendants had put the name on the shovels to avail themselves of the reputation of Collins & Co. Collins & Co. subsequently reorganized as a corporation. This corporation was held to be entitled to an injunction against the defendants to restrain them from the further use of the name and to compel them to account for the profits.

To constitute an infringement of a good trade-mark it is not necessary that the imitation be exact. Any colorable imitation is sufficient. Thus, where the trade-mark was "Stephen's Blue Black," printed on a label in white capitals and large type, it was an infringement to sell an article under the name "Steelpen's Blue Black," printed on a similar label in a similar way. Any imitation which strikes the eye in such a manner as to suggest the appearance of the trade-mark, and calculated to deceive ordinary persons who do not observe details carefully, but trust to general effects, will be restrained by injunction.

### Our Trade with Colombia.

The revolution which has been going on in Colombia since the beginning of the year, and is not yet ended, has a double interest for the people of this country; it interrupts the steadily-growing trade we have been carrying on with Colombia, has endangered one of our highways between the Atlantic and Pacific, and inflicted heavy losses on American citizens, through the burning of Aspinwall, founded 35 years ago by Howland, Aspinwall & Co., preparatory to the building of the Panama Railroad, now the property of the Panama Canal Company.

The Republic referred to was formerly called New Granada, which, as the result of a revolution, was transformed into the United States of Colombia, the new Constitution dating from May 8, 1863. The confederacy consists of nine States; while the Federal Union elects its President, each State elects its own President, four of them for four years, and five for two years. By this arrangement the chances of revolution are multiplied, and frequently the Federal troops have been in conflict with State troops, in order to prevent a local uprising from becoming general. Thus the State of Panama has during the first three months of this year had no less than four Presidents. The present revolution has, however, not been confined to the deposition of State Presidents, but has for its aim the ousting from power of the Federal Executive, President R. Nunez, whose term of office commenced on April 1, 1884, and who during a former term creditably filled the Presidential chair. He belongs to the Conservative party and is considered a safe man, although the party in arms against him, the Liberals, allege that he is under church influence. Up to April 8 the Government troops had gradually mastered the rebellion everywhere except in the ports of Panama, Sabanita and Santa Marta.

In 1846 the United States made a treaty with New Granada, ratified in 1848, which contains the following clause:

The United States guarantees, positively and efficaciously, to New Granada the perfect neutrality of the Isthmus of Panama, with the view that the free transit from the one to the other sea may not be interrupted or embarrassed in any future time while this treaty exists, and in consequence the United States also guarantees, in the same manner, the rights of sovereignty and property which New Granada has and possesses over the said territory.

No sooner was our Government informed of what had happened at Colon-Aspinwall and Panama, early in April, than additional men-of-war were dispatched to both ports with a respectable force of mariners on board, to be landed for the protection of American citizens and property, and the keeping open of the transit.

Central America and the Colombian portion of that part of our continent are becoming so important, commercially and strategically, that the action of our Government is a matter of the greatest interest; the ever-recurring revolutionary troubles and warfare in those regions are injurious to commerce and traffic at large, and as the finances of Colombia, for example, are too crippled to make that country pay heavy damages, a prolonged occupation of the isthmus may be necessary till a Government be established strong enough and stable enough to guard the transit and American property against revolutionary surprises, which, in the case of Colon-Aspinwall, involved a wholesale destruction of houses, wharves and goods to the amount of some \$10,000,000. If we failed to do so, the French would consider themselves called upon to interfere and protect French citizens and the Panama Canal Company's property.

The manifest inability to govern themselves in peace, which so many of our Spanish-American neighbors have given proof of, is a great nuisance, yet there is no remedy for it except when a case arises like the present one, in which our interests are directly injured, and the country is too important to be left at the mercy of political highwaymen. A few statistics will show the magnitude of our trade with Colombia direct. The total import of Colombian products into the United States during the eight fiscal years, 1869-76, was \$51,725,534, and during the following eight years, 1877-84, \$45,660,945. In one year, 1874, when the price of coffee was high, our import thence amounted to \$12,284,063. Latterly nearly all Colombian products have sold low; hence the amount fell off, but in bulk the import has been steadily on the increase. Our domestic export during the first period of eight years named amounted to \$34,373,809; during the last eight years it rose to \$43,047,067. The last two fiscal years stood as follows:

	Import from Colombia	Domestic export to Colombia
1883	\$5,171,455	\$6,719,787
1884	3,891,848	6,174,574

The general trade movement in Colombia with foreign countries by land and sea will best show how large our share in it really is:

	Import	Export
1882-83	\$11,504,028	\$14,257,170
1881-82	12,355,555	18,514,116
1880-81	12,071,480	15,836,944
1879-80	10,367,069	15,504,981

The population of the Republic is in round numbers 3,000,000, including 50,000 Indians. The capitals of States are Panama, 18,378 inhabitants; Santa Marta, 3500; Cartagena, 7800; Socorro, 16,000; Medellin, 20,000; Tunja, 5471; Bogota (also the Federal capital), 95,000; Ibague, 10,346, and Popayan, 8485.

The income of the Federal Government in 1882-83 was \$5,964,296, and the outlay \$5,066,044. The foreign debt on December 31, 1883, was \$9,570,500, and the home debt \$10,340,383; total national indebtedness, \$19,911,383. The finances of the Government would have been more prosperous long ago if there had not been so many bills for damages to be settled for property taken from foreigners during revolutionary warfare, in the shape of forced loans, &c. The shipping that entered Colombian ports in 1882-83 consisted of 923 sailing vessels, measuring together 40,462 tons, and 588 steamers of a joint tonnage of 668,713. Unstable politics frightening away investments by foreign capitalists, there are, inclusive of the Panama Railroad, only 142 miles of railway in operation in a country measuring 586,600 square miles, about three times the size of Spain, whereas the latter, the mother country, as mountainous as Colombia, has 7770 miles of railway in operation and building. The post office forwarded in 1882-83 only 650,000 letters. Of telegraphs lines there are 2376 miles, and they forwarded 288,876 messages in 1882-83. There are few Spanish-American countries possessing the resources and unrivaled geographical position of Colombia. The province or State of Cauca is described to be a perfect paradise, and has a good harbor, Buenaventura, on the Pacific. Bogota, the capital, has about the same delightful climate as Mexico and Caracas, and the Magdalena is one of the most important and best navigable rivers in South America. The Isthmus of Panama gives Colombia an international importance on a par with that of Nicaragua. Yet, with all these advantages, the country is periodically revolutionized by a set of bad lawyers and generals and the scum of neighboring States, so that it is almost a hopeless case.

### The Coal Strike in Western Pennsylvania.

The striking miners in the Monongahela district in Western Pennsylvania have won the contest, most, if not all, of the mines on the river having resumed at the 3 cent rate. The strike, however, still continues at the railroad mines, some few small mines being at work at the 3 cent rate, others at 2½ cents; but the majority are idle, refusing to pay more than 2½ cents. This condition of things is rather anomalous, and demands some explanation. It is well known that most of the coal mined on the Monongahela River is sent down the Ohio and Mississippi as far as New Orleans. The trade is somewhat uncertain, and shippers must take advantage of the rises in the Ohio to get their coal barges out. When the strike began on the river there were some 9,000,000 or 10,000,000 bushels of coal in the barges ready for the breaking of the ice. The going

out of this coal on the recent rise left a large number of empty coal boats and barges to be filled, and, in anticipation of the rise that can be pretty surely counted on for the last of April or the first of May, the operators deem it best to load their boats at the 3 cent rate. What they will do when the boats are loaded is another question, but it is evident that the labor question in the coal mines of the Monongahela River is by no means settled. As soon as an opportunity offers the probability is that a lower rate of mining will be demanded.

The action taken by the railroad miners at their convention some days ago, to which we referred, in demanding 4 cents a bushel from the mines that were now paying 3 cents, did not seem to meet with the ready acceptance anticipated from the miners at those pits that were at work, they refusing to demand 4 cents, and the indications now are that the railroad miners will resume work at 2½ cents, or ½ cent less than the work on the river. Indeed, there should be this difference always, as work on the river is uncertain and irregular, whereas work on the railroads is generally continuous, or, at least, much more so than on the river. Another convention was called for this week. In the call for the convention the officers say:

It has been suggested to us by the miners of several pits that a conference committee be appointed to confer with the operators, with a view to settling the present difficulty. It is earnestly desired that a full representation be present. Send your ablest and best men, instructed in the matter as well as possible.

This indicates a weakening on the part of the men. The probability is that they will offer as a compromise to the operators 3 cent digging for local domestic consumption and 2½ cent digging for coal for manufacturing purposes and for points outside of Pittsburgh with the scale. It should be understood that the river mines were not interested in the recent arbitration, the parties to that being only the railroad operators and miners.

### Privateering.

Whatever may be the final outcome of Anglo-Russian war menace, there seems to be little probability that more "Alabamas" will be let loose to prey on maritime commerce. The nations which connive at depredations of this character pay too dearly for their compliance, as was seen in the recent experience of Great Britain, when she paid \$15,000,000 under the Geneva award. Besides, Russia is precluded by the convention of Paris from issuing letters-of-marque, unless she is prepared to break through all the trammels of international law. During the past week rumors were freely circulated that Russian agents were secretly negotiating for the purchase of the steamers San Pablo and San Pedro, built for service on the Pacific Coast, and that overtures were likely to be made for steamers connected with various American lines plying from the port of New York. The supposition was that these steamers were intended to harass British trade, but inquiry on the Maritime Exchange failed to secure any facts giving a color of truth to these stories.

Ex-Secretary Evarts, who was interviewed with reference to this subject, is represented as having said that "the Geneva Conference" simply took into consideration the Alabama "claims, and no rule was established concerning privateering." "That matter," he added, "was considered during the conference held in Paris in 1856," and inferentially Mr. Evarts would have it understood that the Alabama claims for damages against the British Government, on account of injuries inflicted by privateers fitted out in British ports, involved no precedent. John Bigelow, ex-Minister to France, while not aware of the existence of any obligations of neutrality stronger than those which were recognized prior to our civil war, admitted that "in presenting to the English Government a bill for damages sustained by our commerce in consequence of England's violation of neutrality during our civil war, and in receiving a sum of money which we allowed ourselves to declare to be a satisfaction for those damages, we have laid ourselves open to have a similar bill presented to us for the damage which might result to Russian or English commerce if we shall permit our ports to be made the shelter and nurseries of privateers." According to another authority quoted, the United States Government, by accepting the Geneva settlement, has bound itself by "a precedent which binds not even England."

From a cursory examination of a very important question, which is liable to become prominent within a short time, it would appear that the United States are doubly bound by obligations of neutrality as regards privateering in case of war between England and Russia. Previously existing treaty stipulations are defined and a precedent established by our participation in and acceptance of the Geneva award, even though the question of privateering as an international issue was not presented, much less considered, in the deliberations at Geneva. Our position of neutrality not being questioned, the single point will be, in the contingency assumed, the practicability of repressing privateering along our extensive line of coast. England tacitly confessed her inability in reference to the Alabama, and the Washington Government was never distinguished for its success in dealing with filibusters.



### An Unfortunate Iron Plant.

The recent sale of the blast furnace and rolling mill of the Manchester Iron and Steel Company, of Allegheny City, Pa., which was referred to in our department of industrial news, calls to mind the checkered history of the property. The statement is made that this plant has been directly connected with more financial failures and business embarrassments than any other property in Western Pennsylvania. Be this as it may, it seems that the property has certainly been ill-fated. Quite as well situated and possessing the same advantages as any of the other Allegheny County furnaces, the plant has never yet arisen to the dignity of a permanent success. The old Superior Furnaces, the commencement of the plant, were built in 1862-63, and were among the pioneers of the blast-furnace industry in Pittsburgh, being preceded only by Clinton Furnace, of Graff, Bennett & Co., and the Eliza Furnaces, of Jones & Laughlins, which plants were built, respectively, three years and one year before. All five furnaces were of the same size, having 45-foot stacks and 12-foot boshes. In 1865 the owners of the furnaces, who took the name of the Superior Iron Company, built a rolling mill especially designed to roll rails, and it may be noted that the product of the mill in this line had a very good reputation. The Superior Iron Company did not long operate their property, but leased the furnaces to Ritchie, Herron & Co., and the mill to an organization which took the name of Harbaugh, Mathias & Owens. The furnaces were not long in the hands of Ritchie, Herron & Co., and were afterward operated by other lessees, finally passing into the hands of Harbaugh, Mathias & Owens, and making their last blast in 1874. Then in 1875 came the heavy failure of Harbaugh, Mathias & Owens, and the property was bought in by the creditors for \$600,000. These formed, after a time, the Manchester Iron and Steel Company, and leased the mill to Andrew Klonan in 1878. He altered the mill and adapted it to the manufacture of structural iron, as the day of iron rails had practically come to an end. The mill was operated on structural material by Mr. Klonan until his death, when his sons stepped in and carried on the work. The two old furnaces, now become very old-fashioned and out of date, were meanwhile crumbling away rapidly. About the year 1882, the internal strife which has been going on among the various creditors, who, as related, accidentally became fellow stockholders in the Manchester Iron and Steel Company, came to a head, and the New York division of the company were enabled to assert their supremacy. This they did by negotiating a loan with the Metropolitan Trust Company, of this city, and utilizing the funds thus obtained in tearing down the time-worn furnaces at Allegheny City and erecting on their site a large furnace embodying all the improvements of the day, as did its predecessors when they were built. The Manchester Iron and Steel Company had, however, barely gotten their furnace, which they named the Edith, into good working order, when they themselves became involved in embarrassment and were compelled to make assignment. About the same time the Klonan Bros., who, as trustees of their father's estate, had been operating the rolling mill, found themselves in financial straits and also failed. Thus again the whole plant was idle from the same cause.

At this juncture the assignee, Mr. Henry Stanton, of this city, showed his fitness for his position in an unexpected manner. The two confident authorities of the Manchester Company had invested in several thousands tons of ore, which lay a dead weight upon the affairs of the company. Mr. Stanton went to Pittsburgh, took charge of the Edith, put her in blast, and worked up the whole amount of ore into pig iron, which could be much more easily disposed of, and thus materially lightened the load under which the company were laboring. But all endeavors were ineffectual; affairs were bound to take their own course, and the property, which the owners had acquired as creditors, has now passed into the hands of the creditors' creditors. It is stated that the last named parties intend to put both the mill and furnace in repair, and, when prices will warrant such action, will put them both into operation. It is certainly to be hoped that they will be able to "down" the relentless fate which has seemed to rule over this plant, and that a third company of creditors will not appear and take charge of it.

The beam trade has attracted some attention recently, and its supposed prosperity, comparatively speaking, has been an incentive to works producing other manufactures of iron and steel to enter into the business. Not long ago Messrs. Jones & Laughlins made their appearance in the markets, and notably in Chicago, for a while competition was sharp. They joined the association, however, and the only echo of the struggle was the movement recently initiated with considerable show of vigor by the Cornells, of this city, who had made a contract with the firm mentioned, before they joined the association, for quite a large lot of beams. The action referred to was the public announcement on the part of the Cornells that they were ready to sell beams to consumers at prices, not specified, below the rate agreed upon by the association, or 3 cents on dock in New York. We have

been told that this step was taken from the laudable motive of enabling a long-suffering public to put up fire-proof structures. There are now in the country nine works making or ready to make iron and steel beams. A tenth, at Chicago, will soon be ready to enter the market, and presumably will go through the experience of the latest additions to the number of those in the association. While it is not likely that the latter will be seriously disturbed by the advent of this new rival, the fact indicates a tendency to go into the business, growing out of the idea that it is a "good thing." We have reasons for believing that others are casting wistful eyes in the same direction. The fact is that the beam trade is an expensive one to handle. In order to meet requirements a pretty heavy stock must be carried, and there is a good deal of extra cost growing out of the necessity of cutting to lengths ordered. In the aggregate the capacity of the works now equipped for rolling beams is greatly in excess of the demand, and should business not improve there is the danger that unrestricted competition, because of the starting of a number of new works, would quickly drive values to an unremunerative basis. As it is, a pretty sharp struggle for the business of the large tide-water towns is being made by the representatives of foreign makers.

### The Strength of the Amalgamated Association.

The list of delegates to the scale convention of the Amalgamated Association, to be held in Pittsburgh, Saturday of this week, gives some indication as to its membership in the West. Under the by-laws of the Amalgamated Association each district is entitled to send one delegate to the scale convention for every 300 members in the district. Six of the seven districts are west of the Allegheny Mountains. The first district includes Pittsburgh and the immediate vicinity; the second what is known as the Wheeling district; the third, the Cincinnati district; the fourth, Chicago and Milwaukee; the fifth, Terre Haute and St. Louis; and the sixth, the Mahoning and Shenango valleys and Northern Ohio. At the several conventions and in the various districts on Saturday, the 4th, the number of delegates elected was as follows:

District	Delegates
First	10
Second	3
Third	1
Fourth	1
Fifth	1
Sixth	6
Total	22

On this basis the membership of the Amalgamated Association west of the Allegheny Mountains is 6600. There has been considerable discussion recently in the Pittsburgh papers as to the actual membership of the association. The Pittsburgh Dispatch gave a list of the mills in Pittsburgh and vicinity, together with the number of union men in each mill, which showed a total of 22,000 iron and steel workers, among whom it was claimed that the Amalgamated Association had but 1468 members, leaving 20,532 non-union workmen. Mr. Martin, the secretary of the Amalgamated Association, as reported by the Pittsburgh papers, calls in question this statement, and asserts that the membership at certain mills is in excess of that given in the table, but, unless he can show that the laws of the union are not observed and that the number of members necessary to send a delegate to the scale convention is in excess of 300, the membership of the Amalgamated Association in the first district, which is Pittsburgh, cannot exceed 3000, and the entire membership in the West 6600. This is certainly a great falling off in an association that at one time claimed through its officers to have a membership of 65,000.

The secession of the nailers from the Amalgamated Association is an accomplished fact, a new organization, known as the United Nailers of America, having been formed at Wheeling a few days since. This organization includes most of the nailers west of the Allegheny Mountains. The Amalgamated Association are making the best of it, and are charging that those who have dropped out are principally of that class who have no further use for the society except for personal ends. It was our impression that all of the members of the society were members for personal ends. It may be possible that this organization has latent in it an amount of patriotism and high principle for which we have never given it credit, but, judging by its action, the only objects it has served have been personal ends—that is, to secure the highest wages possible with the least consideration of the conditions of trade, and none whatever of future injury to their own craft.

At a meeting held in the Metropolitan Hotel, New York, March 14, the representatives of a syndicate which has secured control of four groups of Cuban ores, said to be extremely valuable for steel and foundry purposes, decided to begin mining and shipping ores to this country as soon as wharves and railroad communication with the mines can be built. The promoters of the enterprise are prominent iron men and large consumers.

Three firms in New York City have recently sent to Central America more than 300,000 cartridges.

### The New Clapp-Griffiths Plant at Pittsburgh.

In a few lines we announced last week that the new Clapp-Griffiths plant at the works of Messrs. Oliver Brothers & Phillips, in Pittsburgh, had begun to work. Like a large number interested in various branches of the manufacture of iron and steel, a representative of *The Iron Age* had been patiently waiting for that event, in order to watch the operations of a process which has made such a sensation. On Thursday last a party visited the mill, among which were Senators Morrill, of Vermont, and Plumb, of Kansas; Mr. T. J. Peters, of the Brierfield Coal and Iron Company, Alabama; General Powell, of Belleville, Ill.; Frank Witherbee, of Crown Point, N. Y.; and Messrs. Anderson, of the Tredegar Company, Richmond, Va. We have given a full illustrated description of the plant on a former occasion, to which nothing need be added now. It should be stated, however, that the general arrangement adopted is the outgrowth of local circumstances and of the history of the plant. As will be noted by referring to the drawings published in *The Iron Age* of March 12, the converters are placed at a considerable height above the ground, which, while it gives facilities for casting, has certain drawbacks, notably in requiring a high lift for the hydraulic ram which raises into the place newly-lined bottoms for the converter. A very neat design has been made by Mr. J. P. Whitrow for a 2-ton vessel, the center of the tapers of which is only 4 feet 7 inches above the ground. The stationary body of the converter rests on four legs, similar in general design to those of a steam hammer. In this manner the bottom need only be lifted a few inches and the whole of the converter is solid. In this new design the converter will be allowed to blow against a wrought-iron shield. Some trouble and delay in starting the new plant was experienced through the fact that the pipe for the hydraulic cranes and lifts had been laid in partly frozen ground and leaked in some places. Then, too, the drying of the bottoms was not as thorough as it should be. With one of the converters, during our visit, the water was dripping out of the bottom while the blow was progressing. The principal reason, however, why the plant is not as yet coming up to ordinary work is that the melting capacity of the one cupola provided is not, by far, able to supply both of the converters. A second cupola has been ordered and will probably be in place in a short time.

Meanwhile the plant is working single turn, and its capacity to produce quantity can only be gauged in a general way from the duration of the blows, and the time required for other necessary operations. At the time of our visit one of the converters was being made ready for work; the other was running with a new bottom. The iron, which was Bessemer stock, was tapped from the cupola into the traveling ladle and poured into the converter. It has been suggested that oxidation of a favorable character begins even while this pouring is going on. As soon as the metal rises above the tuyeres the blast-gauge showed a jump of 7 to 8 pounds pressure. At the first blow witnessed, the smoke of burning iron at once made its appearance, the color and character of the flame remaining the same for the first seven minutes, when it gradually changed to a brilliant white flame, accompanied by the ejection of cinder from the converter and a flow of slag from the cinder notch. This period, we are informed, sets in from four to seven minutes after the beginning of the blow. Eleven minutes after the beginning of the blow the taphole was opened, the tuyeres being kept open by closing the main blast valve and opening a valve admitting blast to a "pass-over," a pipe of smaller diameter connecting the parts of the main blast pipe in front of and behind the main valve. This reduces the pressure to 2½ pounds. The original plug arrangement has been apparently abandoned. The steel as it flows from the tap is very hot, and is generally accompanied by some cinder. On the bottom of the ladle into which it is tapped is placed some charred wood, sometimes soaked in oil, the office of which is to produce a sufficient agitation of the metal to aid in expelling occluded gases. While the steel is flowing the needed quantity, about .75 per cent. of 85 per cent. ferromanganese—previously broken into small pieces and preheated over an open fire—is added. At present bottom casting is resorted to, the ingots standing in groups of five on an ingot car. The usual size is 8 x 7 inches, though 6 x 6 inch ingots have been cast. The question of casting is one of exceptional importance to the Clapp-Griffiths process. It is the intention to experiment with top casting, with the aid of a distributing spider, so as to avoid the drawbacks of casting under a heavy head of the ordinary method, and do away with the heavy percentage of sprues now made with the bottom casting method.

At the time of our visit the charge of iron was about 3750 pounds. There appeared, however, to be some variation from this, since in one or two blows practically no cinder flowed from the notch, which would appear to indicate that the level of the bath was lower. It would be a question of some interest to determine whether the fact that the cinder was not got rid of in this way has any appreciable effect upon the elimination of the silicon, which is conceded to be the secret of the success of the method in dealing with high-phosphorus metal and in imparting to steel from ordinary stock the high quality established. After the blow has been completed, the tuyeres are cleaned and the vessel is ready for another operation. The length of time required for blowing proper varies from 10 to 15 minutes. During our visit two blows were made in one hour with one converter, which was, however, idle part of the time. Running on 2 gross-ton charges, for which the converters were designed, the capacity of the plant would be from 65 to 70 tons per 10-hour shift per converter.

One of the bottoms which had been recently changed had stood 22 blows. An examination of its condition showed that in reality the wear had been confined to a ring at the tuyeres of about 3 to 4

inches. All the repairs called for was the putting in of a new set of tuyeres and patching the damaged parts near them. The balance of the bottom was apparently uninjured, and was exceedingly hard and firm. The opinion is expressed by those well qualified to speak with authority that the life of the bottom will certainly soon come up to 30 to 40 blows. The facilities for exchanging a new for an old bottom are very good, the number of connections to be made being few and easily taken care of. With green hands it has taken 15 to 20 minutes to effect the exchange, so that with a well-drilled force the time could probably be reduced to less than half. On the basis of the force at present employed, the plant, when running full and producing from 130 to 140 tons per turn, would, liberally estimated, call for a working force of 20 men per shift, whose aggregate wages would be \$32. An important point, and one which has much impressed notably those visitors who are examining the process with a view to introducing it for the manufacture of nails, is that it rolls easily. All the work done by Messrs. Oliver Brothers & Phillips in converting the ingots into marketable shapes is done with rolling trains which have hitherto served for ordinary wrought-iron work. At the time of our visit the steel, which, by the way, was .08 carbon, was being rolled into strips for the manufacture of steel locomotive boiler tubing. This was being done in an ordinary 16-inch bar train.

A good deal of significance is attached to this fact, since it indicates that iron mills equipped with trains of fair strength may use them for rolling the ingots or slabs or other shapes they may desire to work. It means that it does not follow that a change to steel calls for an expensive blooming mill, costing, say, \$40,000, which, after all, would be only temporarily employed. Another point which is strongly illustrated by the working of the mild low-silicon steel in the rolling mill is its welding power. Tops of ingots which would be generally cut off come out exceedingly well under the rolls, and it has been noted that in some instances where cracks appeared in the first passes, as the result of some irregularities in the working of the mill, they welded up in later passes. These are features which strongly impressed a number of Wheeling nail manufacturers who visited the works after their meeting at Pittsburgh on Tuesday last.

We understand that in a few weeks the works will be in a position to make a series of tests with irons from different localities and of different grades, and it is likely that at the same time further experiments will be carried out to ascertain how far it is possible to go in the direction of high phosphorus. It may be again stated in this connection that none of the gentlemen connected with the development of the process have claimed, or do now assert, that the high-phosphorus steel thus far produced is as good as the metal which can be made from pure stock. They do insist, however, that it is admirably adapted to a great variety of purposes for which steel could not be used if starting from the same cheap raw material as the wrought iron.

As yet, we are informed, no basis has been settled upon for the granting of licenses to build plants. Some of the plans originally considered, and referred to in newspapers in some instances, have been abandoned. It is certain that, so far as the mechanical details of the Clapp-Griffiths plant are concerned, a great step in advance has been made over the crude first arrangements in England. In a few weeks the evidence of what can be done by continuous work will be at hand, when we shall again refer to the subject.

### WASHINGTON NEWS.

(From Our Special Correspondent.)  
WASHINGTON, D. C., April 14, 1885.

Attorney-General Garland has transmitted to the Secretary of the Treasury his reply to the interrogatories of the department in reference to the status of the steel-bloom cases, as affected by the decision of the United States courts, and the appeal of his predecessor to the Supreme Court of the United States on a writ of error. As already said in this correspondence, the appeal was dismissed, thus leaving the duty as fixed by the courts at 30 per cent. ad valorem, instead of 45 per cent. ad valorem, as previously assessed by the department. Attorney-General Garland gives the opinion that the dismissal of the appeal was on the merits of the case, and not upon a mere defect in the record. This, therefore, settles all the cases dependent upon this decision of the court. A statement has been prepared giving a list of importers benefited by this opinion and decision. The Commissioner of Customs will make up the accounts showing the excess of duty paid, it being the difference between 30 and 45 per cent. ad valorem in favor of the importer, and will submit them to the auditor and comptroller for settlement. The aggregate amount to be refunded will aggregate over \$200,000, taken upon a general estimate.

### THE TARIFF IN EUROPE.

The economic crisis in Europe and the warlike outlook is the subject of interesting reports which are being carefully collated, and which will be issued for general information. The claims of the agricultural districts of Europe for protection are being raised also by those interested in manufacturing industries. Secretary Manning is giving close attention to this question as it presents itself in European countries, in order to have the benefit of the views of the publicists of the Old World, as well as the practical results of labor and industrial agitations in that part of the globe.

### THE ORDONANCE QUESTION.

A powerful movement is on foot to effect a thorough reorganization of the Ordnance Department of the army. During the Fortieth Congress an effort was made to abolish this department, and the project went so far as to receive the recommendation of a joint committee. The report on that subject, among other things, said:

"5. That every encouragement should be given to inventors and a full and fair trial accorded to all devices offered to the Govern-

ment that promise a solution of the ordnance problem. \* \* \* That the Ordnance Department of the army can be entirely abolished with great advantages as to economy and without detriment to the good of the service. The duties now performed by officers of that corps could be performed by officers detailed from the artillery service, under the direction of a chief stationed at Washington. In this manner the whole expense of the ordnance establishment would be saved, and artillery officers, who have not only scientific training, but practical experience, would have a voice in the selection of the guns and ammunition they are required to use."

The indecision of the ordnance officers as to the best patterns has done much to interfere with the securing of proper appropriations for experiments in improved guns. In a statement to the Senate Select Committee on Ordnance General Banet said:

"To return to the matter of steel guns, I presume that to make one with bands of steel and another wrapped with wire would probably take me at least two years. If we succeeded we could go on making steel guns of that caliber, and at the same time take a step further and try a 10-inch gun; that would take a year or two more. Then, if we were successful, we could go to a 12 inch gun, which, of course, would require increased plant and heavier hammers. I should say, if we had the means of going on, that in the course of eight or ten years we ought to have the requisite plant in this country to make guns of any size we might require; but we have not got it now; we have barely got heavy enough hammers for the smaller caliber of guns, such as 6-inch and 8-inch, and at several of our best establishments a steel ingot cast at one place has to be sent to another place to be forged. Steel-making of a quality suitable for guns has not yet progressed beyond the experimental stage. As to giving an order for and giving the money to make 50 steel guns, we cannot do it. We have to commence at the very beginning and learn how to make them. Our people here have got to learn how to produce the metal."

The Committee on the Investigation of the Steel-Producing Capacity of the United States will be ready to report to the next Congress.

### CUSTOMS DECISIONS.

The following is a synopsis of sundry decisions rendered by the Treasury Department in customs cases during the past week, full copies of which will appear in the monthly digest:

"A model of the steamer Umbria, showing the latest improvements in the art of shipbuilding, is exempt from duty under the provision in the free list of the act of 1883 for 'models of invention and other improvements in the arts,' it not being a model which could be fitted for use. Gold pens are dutiable at the rate of 12 cents per gross, under the provision in Schedule C, Paragraph 208, for metallic pens. Metal and cotton cord, consisting of a core of cotton threads inclosed in a flexible metal covering, is dutiable, under Decision 6547, and T. L. new, 427, at 25 per cent. ad valorem. The rule laid down in Decision 2034, that collections of antiquity, to be admitted free of duty, must be productions of a period prior to the mediæval period, is no longer to be considered in force, but each case is to be judged upon its merits as it may arise."

### Low-Silicon Bessemer Steel.

To the Editor of *The Iron Age*.—DEAR SIR: In the numerous published articles on the Clapp & Griffiths process, it is claimed that by their peculiar mode of manipulation they are able to eliminate the silicon much more thoroughly than in the regular Bessemer process, and thereby produce a superior quality of steel. It may interest some of your readers to know that by the observance of proper precautions and careful blowing the regular Bessemer process will produce steel lower in silicon and quite as regular as is claimed by the advocates of the Clapp & Griffiths process. In our practice we find the complete elimination of silicon to be principally dependent on the temperature of the "heat;" when this is properly regulated there is no difficulty in eliminating practically all of the silicon. In the following analyses the eight samples of low-carbon slabs and the two samples of 12 to 15 carbon billets were selected at random from our ordinary stock:

Low-Carbon Slabs.			
Blow.	Carbon.	Silicon.	
3286	.07	.04	
3300	.08	.01	
3360	.09	.05	
3363	.08	.05	
3479	.07	.04	
3477	.07	.04	
3529	.09	.05	
3540	.08	.05	
Average	.08	.07	
12 to 15 Carbon Billets.			
3332	.13	.04	
3408	.14	.04	

We find no difficulty in keeping the silicon in our low-carbon steel below .01, and in 12 to 15 carbon steel below .02. Finally, in order to verify our determination of silicon, portions of the drillings from blow 3286 were sent to Booth, Garrett & Blair, and A. S. McCreath, who report as follows:

Booth, Garrett & Blair, silicon	.004
McCreath, silicon	.002

E. F. Wood, Chemist.

HOMESTEAD, PA., April 8, 1885.

### Obituary.

WILLIAM HANSON.

Mr. William Hanson, a prominent engineer and inventor, who lived at Greenpoint, Long Island, died Tuesday of paralysis, being in his 73d year. He was the original inventor of the compressed-air rock drill, which was used for the first time in drilling the Hoosac Tunnel. For a number of years he was connected with the Novelty Iron Works in the capacity of master mechanic, and built the ice machines for the Morgan Iron Works. He invented the positive steam pump, which is used for feeding boilers. He was well known by most mechanics for his ingenuity and mechanical skill.



## THE WEEK.

The London *Shipping Gazette* complains that overproduction of tonnage "is still in full swing, for the new vessels which are being turned out every month are altogether in excess of the requirements of trade," but the havoc caused by foreign war, together with the demands for transportation, may soon relieve the plethora.

A Sheffield (England) paper describes a steel stern frame recently made by Wm. Jessop & Sons for a twin-screw steamer building at Belfast. The total length of the frame is 21 feet, the breadth of the bottom 17 feet and 10 feet across. This is the largest stern frame in area that has ever been made. It weighs 13 tons, and it was cast solid in one piece in crucible steel. About a third of the way from the bottom two large bosses project 5 feet on each side, so that altogether the frame was about as awkward a piece of mechanism to carry on a railway as was ever put on a truck. It was delivered to the Midland Company on Sunday, March 15, that day being selected as the one on which the least inconvenience would be caused to the traffic.

A powerful ironclad will be built in England for the Chilean Government, to replace two torpedo rams sold to the British Government.

About 600 men are employed in cutting a tunnel 1 mile in length through Tuscarora Mountain, Fulton County, Pa., for Vanderbilt's new Southern Pennsylvania Railroad.

Fifty or more puddlers at Pittsburgh are about leaving for the West, alleging that the new steel process has ruined their occupation, and 100 have left for iron mills in New Zealand.

In some provinces of Brazil iron ore is used in large quantities as building stone, so abundant and ready to hand is it.

The Mexican Central Railway Company have ordered machinery for working the Jimuleo Coal Mine. There is every indication that it is a valuable "find."

Government advices from Peking state that the Chinese Government adheres to the peace preliminaries signed on the 4th inst.

The Shenango and Mahoning Valley blast-furnace owners have formed a syndicate for the purpose of buying a large block of coking coal lands in the Connellsville field, with a view to the manufacture of coke for use in their own furnaces.

Under a charter granted by the Legislature of North Carolina, the Roanoke Navigation and Water Power Company have been organized, with a capital of \$500,000, to encourage the erection of factories.

In the Illinois House of Representatives the "Truck bill," providing that employees shall be paid in cash and not in trade, was passed to a third reading by a vote of 94 to 24.

The anticipated "fast time" across the Atlantic, the coming season, will be of lessened interest in consequence of the withdrawal of so many of the best steamers for war service.

The first technical school in New Jersey organized under the law passed a year ago granting a subsidy to such institutions was opened on the 9th inst. in Newark. A new building has been erected especially for the school and competent instructors engaged. The object is to teach children useful arts and trades.

The commission created to rebuild the burned portion of the New Jersey State Capitol is inclined to believe that anything less than an entire reconstruction of the front of the building will be a wasteful expenditure of public money.

Fifty dwelling-houses will form part of the freight of a vessel bound to Aspinwall, South America, from Portland, Me. The houses are what is termed "knock-downs;" every part, including roof, is finished, and shingles are painted, and they are ready to be set up in about an hour's time after arrival. They were made in the Ottawa district, Canada, and are intended for the men who are at work on the canal. By sending in this form about 33 per cent. in freight is saved.

The mere weight of rails, sleepers and plates required in the construction of the Berber-Suakin Railway is 45,000 tons, which must be conveyed on an average 120 miles. Assuming a camel load to be  $\frac{1}{2}$  ton, and a camel to march 10 miles, it would require 7,400 camel-loads daily to complete the carriage within the year.

The French frigate *Iser* will leave Rouen for New York about the end of April, with Bartholdi's statue of "Liberty Enlightening the World."

Accounts continue to be received respecting the enormous production of the Russian oil fields at Baku, where one of the wells opened spouted oil to the height of 100 feet. The product is refined on the spot by a process of distillation, the residue being used as fuel, both for steamers on the Caspian and upon many of the Russian railways.

In the United States Circuit Court at San Francisco, last week, Judge Sawyer rendered an important decision in the case of Adele Taft, a citizen of New York, vs. Arthur W. Bowman, an insolvent fiduciary agent. She brought suit to recover \$64,000 from defendant after the insolvency proceedings had begun, and attached his property. The Judge decided that a foreign creditor cannot come in and attach property of an insolvent after insolvency proceedings have begun, and thereby obtain priority over other creditors, and the attachment was discharged.

A San Antonio (Texas) correspondent shows how Mexican smugglers evade the

payment of customs dues. He says: "Their bands extend from El Paso del Norte to Matamoras. They have a language and sign manual of their own. They are splendidly mounted and splendidly armed. They are the gayest dressers in the Mexican nation. They are the most reckless spirits of either country, picked men every one of them; young, hardy riders, straight shots, fertile in resource, beloved by the people, friends of the small merchants, the lights of the *baile*, supporters of the priesthood and rabid patriots every scoundrel of them. The traffic consists in the most valuable articles of Mexican produce—horses, cattle, tobacco, mescal, linen, &c.—smuggled into the United States, and cloths, arms, wood, iron and noticeably morphine and quinine taken into Mexico. As a familiar illustration: Calico is bought on this side the river at 5 cents per yard, and the Mexican duty is 12½ cents. It is sold in Moncloa—beyond the free zone—at 6 cents per yard. It is hauled 150 miles over a rough country, alleged to be under the complete control of the Mexican officials, and sold at 1 cent. advance on American prices. This is done openly in the principal stores of the town."

The famous Holland ram, said to have cost the friends of Ireland \$15,000, is secreted at New Haven, apparently awaiting the course of events.

At Zacatecas, Mexico, some very valuable tin mines are said to have been developed. Tin nuggets, one weighing over 5 pounds, have been taken out of the gravel. This large nugget is second only to the largest ever found in the English mines of Cornwall.

The White Star Line between New York and Liverpool will have two important additions to their fleet—the *Belgic*, which was launched in January and will shortly be ready for sea, and the *Gaelic*, now at the yards of Messrs. Harland & Wolff, Belfast, Ireland, having her machinery fitted. Four large steamers for the Havre Line are building at St. Nazaire.

The German Reichstag has approved the Chancellor's line of steamers Subsidy bill, so that the routes to Australia and Eastern Asia, with a branch line to Trieste and Brindisi, are now secured, at a cost to the nation of 4,000,000 marks, for the next 15 years. The Australian line is to include a branch one to the Samoa and Tonga Islands.

The report of the Cunard Steamship Company states that during the year which ended last December the depression in trade had so affected freights that the directors had been unable to declare dividends or to add to the insurance fund.

The *Northwestern Lumberman*, of Chicago, remarks that there will be little navigation on Lake Michigan before April 20 to 25, and it is expected that but a small amount of lumber will be received before May 1.

Trade with Hankow is in a demoralized condition, owing to the war between France and China; but the imports of American sheetings, drills, twills, jeans, ginseng and kerosene have been very large, and are increasing. Consul Shepard adds that another year will doubtless see the completion of a telegraph line from Hankow to the Yangtze River ports.

Consul Morlan goes into ecstasies over the trade of Belize with this country. He says: "I have seen American clocks that came through Great Britain, and the commissariat here recently received a large consignment of Chicago corn beef from there." The largest imports from the United States consisted of beef and pork, flour, cotton goods, bullion and coin, lumber, boots and shoes, butter, drugs and chemicals, hardware and cutlery. The export trade to the United States consisted of bullion and coin, bananas, coconuts, rubber, raw sugar, logwood, mahogany and plantains, in the order named. He gives abundant figures to show the magnificent opportunities for American trade in that country, though Great Britain is now in the lead, having increased its business there 100 per cent. during the last year.

San Domingo is alleged by Consul Astwood to be in a desperate strait. Commerce has reached its maximum unless a reciprocal treaty can be effected with the United States, while the price of sugar and tobacco has been so reduced that the planters are in a bankrupt condition. The Republic is overwhelmed with debt, on which ruinous interest is being paid. A railroad is being built from Samana Bay to Santiago, which, if ever completed, will open up rich tracts of land capable of producing immense crops of sugar, coffee, tobacco and tropical fruits. At present there is not a single wagon road penetrating more than 3 or 4 leagues into the interior. During 1883 the imports amounted to \$3,142,102, and the exports to \$2,129,266. From the single custom house of San Domingo the exports were \$954,329, of which \$856,975 came to the United States in the shape of sugar, honey, molasses and lignumvite.

Resolutions before the Dominion Parliament contemplate the opening of negotiations with the United States for the renewal of reciprocal trade relations. This movement is in anticipation of the termination of the fishery clauses of the Treaty of Washington, now not very remote.

It is intimated from London that, unless Americans show more interest in the London Inventions Exhibition, the space allotted to them will be withdrawn.

Cyrus W. Field withdraws from all official connection with the Western Union Telegraph Company and other corporations, preparatory to retirement from active business life.

The Cramps, at Philadelphia, have begun work on a new steam yacht, on their own account, and she will be 160 feet long on deck, 22 feet beam and 12 feet 6 inches depth of hold, and will be schooner-rigged. The

engines will be of the triple expansion compound type, with the piston-valve on the high-pressure cylinder, and will develop 1000 indicated horse-power. The boilers will be of steel, to stand a pressure of 160 pounds to the square inch. The vessel will be guaranteed to make 16 knots per hour.

Oak seasoned by steam at high pressure is deteriorated. The outside of the timber appears sound, but the middle is reduced to a condition of brown charcoal. Beams subjected to such treatment are concave on their sides, while those seasoned by simple exposure to the air have somewhat convex sides. Unseasoned oak timber kept in a dry room at 150° F. loses 25 per cent. of its weight in four days.

The tin-bearing area in New South Wales is estimated at nearly 8500 square miles, but at the present time the New England district yields the most of the tin produced.

The United States is said now to be the third largest silk-manufacturing country in the world, and the annual product is placed at \$35,000,000.

Twenty vessels in which Americans were interested have been totally lost in the Chinese seas within the last two or three years. Fifteen of them were owned wholly or in part in Boston, and the aggregate value of vessels and cargoes probably exceeds \$2,000,000.

The latest experiment in the organization of industry comes from Russia, where the employees at the large engineering works belonging to the firm of Struve & Co. have recently been planted in a complete settlement somewhat like Pullman City, near Chicago. The workmen, of whom there are between 3500 and 4000, are lodged in small cottages, most of which are made to accommodate two families only, while the public institutions of the colony include a refectory, a laundry, a hospital, a benefit society, a technical school and a co-operative store. The employers contribute handsomely to the benefit society, but charity in any other form is quite unknown in the place, and the co-operative society pays a flourishing dividend.

The new French Ministry have indorsed the project of M. Ferry's Cabinet concerning the enlargement of the Suez Canal.

A London syndicate has entered into a contract with the Government of Honduras to build and operate in that country an inter-oceanic railway. The concession includes land grants and mining privileges.

Professor Hermann's apparatus for determining the values of various lubricants for machinery consists of a perfectly cylindrical shaft supported on two journals, carried by a branched support which so turns on a hinge that the shaft can be adjusted at an angle of 5 to 10° to the horizon. The upper end of the shaft is rotated by means of a handle. To use the apparatus a bent piece of the same metal as that to which the lubricant is to be applied is placed astride of the shaft and suitably weighted, and the number of turns of the handle requisite to cause it to slide along the shaft with various lubricants are noted. The greater the distance traveled for a given number of revolutions the more efficient the lubricant.

The Pennsylvania Railroad will locate their Schuylkill Valley shops at Reading, and employ 1000 men there, giving them most of the work from the Eastern Division and branches of the system.

W. C. Andrews, who is interested in putting cable railroads and steam-pipes into this city, in explaining how he came to give his preference to such investments, said: "Those enterprises in which a public franchise is granted have always been profitable, especially in large cities. In the history of New York, from the days of the Vanderbilt ferries to the present time, ferry enterprises, street railroads, gas, electric light, elevated roads, telegraphs, telephones, have all proven remunerative. It is the steady drip, drip of the few dollars from each one of a million patrons that swells into accumulated millions. No one feels the small tax that is levied indirectly. For instance, it would make very little difference to you in the course of a year whether you paid 5 or 6 cents in street car fare; but to a company carrying 100,000 passengers per week it would mean \$52,000 a year. It is in investments of this character that large returns come on a small margin of profit on each transaction."

After a trial lasting over a month, James D. Fish, ex-president of the Marine Bank, was, on Saturday, found guilty of misapplying its funds and making false entries on the books, with intent to defraud the bank and deceive the bank examiner. The indictment originally contained 25 counts, and the jury found Mr. Fish guilty on 12 counts. These charged specific acts of misapplication of the bank moneys and making false entries. On three of the counts, or as afterward condensed, one count, charging abstraction of the bank's securities, he was not found guilty. One count alone would give Mr. Fish from three to five years in prison.

A Halifax dispatch says that, owing to the unprecedented low price of copper, all mining operations at the Betts Cove district have been indefinitely suspended. About 1000 men were employed there. These mines were formerly owned by a Boston and New York syndicate. The output of ore within a few years has been worth over \$6,000,000.

The existing treaties between the United States and Peru terminate, by notice from the latter, March 31, 1886.

The temper of some of our speculative philosophers, in prospect of a European war, may be judged of from the recent reported conversation of Paul Armour, of Chicago, who gave the impression that he is the representative of England in the hog business in this country. He shook his head wisely when asked about the prospects of war, and

said: "I don't care to express any views, as we have practically furnished all the beef supplies for the British troops for the past 25 years," but he stated that within the past two months his firm had sold to England 20,000,000 pounds of canned beef, besides an enormous amount of mess pork. He was then notified that the English had a two years' supply for the Soudan campaign. But just as he was humbly congratulating himself that he could give the pigs a holiday there came an order for 500,000 cans of beef and an amount of pickled pork which, in his eloquent phraseology, swept the American market. Everywhere that Mr. Armour has been of late he found things flourishing, and he is sure that the depression is over. To listen to him one would suppose that the pig is playing the same part in the United States that the goose did in ancient Rome—saving the Republic.

It is stated on apparently good authority that the fast steamship America, of the National Line, has been purchased by the British Government for £250,000.

The Mason cotton-harvesting machine has reached such a stage in its development as a new and useful invention that it may be said without extravagance that the problem of harvesting cotton by machinery has been solved. The machine was thoroughly tested on the last cotton crop from the moment when the first open bolls made their appearance to the time when the plants, having been frost-bitten, were dry and brittle as glass. In all the stages of the crop from first to last the machine demonstrated its perfect ability to gather the open cotton from the field without the slightest injury to the plants or immature fruit.

The recent slight improvement in English shipbuilding is not such as to warrant expectations of an immediate solid revival. A Glasgow letter says: "The Government has ordered from a Clyde firm, Messrs. J. & G. Thomson, six torpedo cruisers of the *Scout* class; the Pacific Steam Navigation Company have placed with the Barrow Shipbuilding Company an order for two steamers of over 6000 tons each, and the Peninsular and Oriental Steamship Company have ordered from Messrs. Caird, of Greenock, a vessel of over 4000 tons. These are all the contracts of importance that have been placed of late. The Admiralty are soliciting tenders for several ironclads, belted cruisers and torpedo boats, while it is anticipated that ere long some substantial orders for ships will be secured from Germany, as that country is making powerful efforts to keep up regular lines of communication between the Fatherland and certain colonies. As the vessels recently ordered are being built of steel, the makers of that material, acting in concert, raised plates, first, 2/6, and afterward 5/7, making the price £7 a ton. Whether or not the steel-makers will be able to maintain the advanced price will depend very much on the amount of new tonnage ordered from shipbuilders during the course of the summer."

Merchants representing leading interests in St. Louis contemplate an excursion to Mexico.

Brown & Hirth, of Pittsburgh, have received proposals from a New York firm for the manufacture of 50,000 military rifle barrels.

A commercial convention has been called to meet at Atlanta, Ga., on May 19, 20 and 21. The subjects to be considered are commercial and reciprocity treaties between the United States and foreign countries, a national bankrupt law, the compulsory coinage of silver, railway transportation, and such other questions as the convention may deem proper. The purpose of the convention is to influence the course of the new Administration before the assembling of Congress next December.

Railroad construction in the River Plate countries, South America, has come to a halt.

Will British ships be allowed to pass the Dardanelles? is a question which remains to be answered.

Commercial stagnation prevails in Venezuela, Guatemala and San Salvador, and trade continues lifeless in Jamaica, Barbadoes and St. Kitts.

John Stewart, founder of Stewart & Co.'s extensive wire works, in South Easton, Pa., died on the 13th inst., at the age of 80 years. He had been president of the First National Bank of Easton for 12 years.

The total immigration into the United States during March was 23,350, of whom nearly one-third were from Germany, making a total for the last nine months of 224,600, as compared with 304,825 for the corresponding period ending one year ago.

Señor Romero, the Mexican Minister, regards the negotiations for peace now taking place in Central America as a virtual settlement of the question at issue.

A fire at Nos. 82 and 84 Fulton street, this city, damaged goods owned by L. G. Tillotson & Co., dealers in telegraph supplies, to the amount of about \$5000, and the Eaton, Cole & Burnham Company, who occupied the basement, were damaged by water.

The United States Courts having decided that a neutral ship must be wholly owned by neutrals in order to secure protection from belligerents, a lifting out of British ownership is liable to take place, with the result of showing a surprising amount of tonnage carrying a foreign flag, but actually owned by citizens of the United States.

At the meeting of the Maritime Association of New York on Monday the Committee on Revival of Commerce submitted a memorial recommending the adoption of the French system, and proposing that 30 cents per ton be granted by the Government for every 1000 miles sailed by vessels, sail or

steam, built and owned in the United States and engaged in foreign commerce, the payment to continue for 10 years, after which it is to be reduced 10 per cent. annually. Other commercial bodies are asked to join in urging Congress to pass such a law.

There has been a rapid increase within a few days in the demand for insurance to cover the risk of war between Great Britain and Russia, and the inquiry at the Atlantic Mutual office is described by an official as very extensive. The companies are writing on the property of the future belligerents, as well as that of neutrals, and at high as 3 per cent. premium has been taken on a British vessel from the East Indies.

Exporting machinery to Mexico is comparatively a new business, yet our trade to that country last year comprised the following: Machinery, engines, &c., \$1,356,000; other manufactures of iron and steel, \$741,000; hardware and cutlery, \$360,000, making a total trade of \$2,400,000.

## Foreign Markets.

## FRANCE.

PARIS, March 30, 1885.—The mixed up and unsatisfactory condition of local and foreign politics has exercised a depressing influence on general business, and also caused great dullness in the metal trade. Metals are all low, with the exception of Spelter, which is sustained. We quote toward the close, in francs, per 100 kg.: Copper—Chili Bars, 115 @ 118.75; Ingot and Slabs, 185; Best Selected, 128, and Pure Corocoro Ore, 122.50. Tin—Banco, 215; Biliton, 211; Straits Settlements, 211, and English, 207.50. Lead, 36.25 @ 37.25, and Spelter, 37 @ 37.50. Iron.—The most active season for iron in this city being at hand, and accounts from the North being rather more encouraging than elsewhere, prices have been firmly sustained at Paris at 13.50 @ 14 francs as a basis. The Northern rolling mills have resolved not to sell any further below 11 francs, and rather curtail their output. From Saint-Denis we receive the following report: "The improved feeling continues; orders are numerous, though not large; the amount of iron shipped by rail from here during the week shows a notable increase. If the demand continues at the same rate a little more stocks of makers will begin to run low. Coke iron is steady at 14.50 @ 15, and Mixed at 15.50 @ 16; Wire Rods are firm at 17 @ 17.50, No. 20; Sheets of 1 mm. 1b. There is quite a demand for Wire for vineyards, &c., at 12.50 @ 13 francs. No. 20. Wire Nails sell with great ease at 25 @ 26; Axles are wanted at 27 @ 28. Foundries are the only works still complaining. Coal.—The season has so far advanced that our market has become dull and weak.—*Montreux des Interests Matérielles.*

## BELGIUM.

BRUSSELS, March 31, 1885.—Iron.—It is not an easy matter to define with any like precision the tendency of our iron market at this juncture. On the one hand there is a confident feeling that we are on the eve of a revival, if not general, at least partial, and, on the other, consumers show no disposition to pay more than a little more than the low ones that have ruled during the winter time. This disagreement as to prices checks larger dealers, transactions thus being limited to a hand-to-mouth business. Makers cannot, however, be expected to sell for future delivery at ruling rates; they would, many of them, rather stop work, and only struggle on because they do not wish to discharge their workmen and because they are in hopes that better times are near at hand. From Charleroi we are informed that the improvement which was reported from there has made no further headway; all that can be expected for the moment is that the greater abundance of orders may be kept up, small as they are, for the capacity of production of the district is considerable and will not meet with sufficient relief till large orders make their appearance. As matters stand prices can hardly go on improving there. We quote as follows: English Pig, 5 francs @ 100 kg.; Luxembourg: Charleroi, 6.75; Foundry, 4 @ 4.80; Merchant, 11.35 @ 12.75; Beams and Angles, 12 @ 12, and Sheets, 14 @ 24.25. Coal.—Although the Flemish Coal miners' strike has now lasted some time, the market has remained uninfluenced by the same, for even German Coal makes its appearance, and the demand is slack.—*Montreux Industriel.*

## GERMANY.

HAMBURG, March 31, 1885.—Iron.—Our Dortmund correspondent expresses himself in his last report to about the following effect: The general situation of the Pig-Iron market is still much to be wished for. Only the demand for Spiegeleisen has improved slightly during the week, but, as the price offered does not cover cost, not much has been done. Stocks thereof are light. Puddling is depressed. Bessemer is steady. Foundry Pig is less active. Thomas is steady. A better feeling prevails in rolling-mill products; prices for Bar Iron and Sheets remain unremunerative, but the demand for them revives. Even an export demand begins to manifest itself. Bessemer Pig is still a great drawback, but, if the demand continues to increase at the same rate it did during the week, stocks may soon be materially reduced. For Thin Sheets the usual spring demand does not yet set in, but can hardly be delayed much longer. In the Rolled-Wire branch no favorable change can be so far reported, and prices remain weak. Bolts have receded still further. The difficulty seems to be to sell for future delivery at overstocked. Foundries and machine shops are busy in a small way. The first quarter has been dull for the latter; even the demand for mines has been slack, as they generally complain. A good demand is springing up for Cast Iron Pipe, but as so many new concerns here and abroad are coming into this branch of manufacture the thing may be overdone. All Steel-Rail and Railroad Material makers generally are doing remarkably well. Bessemer Steel Mining Rails are selling at 111 marks @ ton. Locomotive and car shops remain remuneratively active. Metals are firm. Lead is wanted, but not higher.—*Borsenhalle.*

## HOLLAND.

ROTTERDAM, March 30, 1885.—Tin.—Our market has gradually lost its animation and firmness, and closes dull at 47.25 guilders @ 50 kg. Banca, on the spot, at 48.75 from the Straits Settlements, spot, at 48.25, and July deliveries of do., 48.75.—*Koch & Vierboom.*

## AUSTRIA.

VIENNA, March 29, 1885.—Iron.—The spring trade has this year opened unusually late in Austria-Hungary, but is now fairly under way, though in Merchant Iron it might be more active at the comparatively low prices ruling. The demand for Pig Iron has, on the other hand, gone on improving under the stimulus of the large preparations which the railroad companies, Government and private, are making for new constructions. The demand for Steel Rails and Rolling Stock, Bridges and Sheds is assuming greater proportions, causing greater firmness in Pig and Finished Iron, but without, so far, leading to an advance. As matters begin to shape the outlook is decidedly reassuring, not to say hopeful. We quote at the close on a steady market: Pig Iron, 47 @ 56 florins @ ton; Merchant, 105 @ 130; Sheets, 150 @ 180, and Beams, 105 @ 115. Metals have been moderately active and sustained.—*Austrian Trade Journal.*

## EAST INDIES.

SINGAPORE, February 23, 1885.—Tin.—The market opened at \$25.60, and, under a Chinese demand, subsequently improved to \$27.14 @ \$28.35 @ picul, while Europeans took 180 tons. Shipments hence since January 1 reach 19,092 piculs to England, 1007 to the Continent and 2343 to the United States. Exchange, four months' bank bills, 3/6 3/4. *Giffen, Wood & Co.*

PEKING, February 24, 1885.—Tin.—Opening at \$24.70 @ \$26.50, the price was sustained till the 14th inst., when the Chinese new year interrupted business, to reopen at an advance to \$25.55 on the 15th, followed toward the close by a further improvement to \$26.10 under a demand from China. While the receipts amounted to 2000 piculs, Europeans took 5500, and Chinese 3300. There have been exported hence since January 1: 24,121 piculs to England; 410 to the Continent, and 3623 to the United States. Exchange, four months' bank bills, 3/6 3/4.—*Schmidt, Kustermann & Co.*



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Union Mfg. Co., 96 Chambers, N. Y. 7

Clock Springs, &c.

Dunbar Bros., Bristol, Conn. 7

Cloth Dryers.

Hill Dryer Co., Worcester, Mass. 10

Coal.

Borden & Lovell, 70 West, N. Y. 44

Farde A. & Co., 111 Broadway, N. Y. 44

Coal and Spice Mills.

Enterprise Mfg. Co., Philadelphia, Pa. 46

Lane Bros., Poughkeepsie, N. Y. 43

Coal Vases.

McClellan & Munschaer, Buffalo, N. Y. 6

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Schoonmaker J. M., Pittsburgh, Pa. 46

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Stannard J. & Co., Chicago, Pa. 35

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New Haven Copper Co., 290 Pearl, N. Y. 2

Coppresses.

Unit Geo. A. & Co., Newark, N. J. 51

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Elizabethport Steam Cordage Co., 48 South, N. Y. 32

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Cincinnati Corrugating Co., Cincinnati, Ohio. 46

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Coverings, Boiler and Pipe.

Shields & Brown, Chicago, Ill. 37

Crucibles.

Seldin R. H., Philadelphia, Pa. 47

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Curry Combs.

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Curry Combs.

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Claworthy F. & W., 82 Chambers, N. Y. 10

Cutlery, Manufacturers of.

North & Kille Co., Northfield, Conn. 8

Vought & Williams, 288 Greenwich, N. Y. 4

Dog Collars.

Medford Fancy Goods Co., 101 Chambers, N. Y. 39

Door Checks and Springs.

Shaw Door Check & Spring Co., Boston, Mass. 10

Door Fasteners.

Martin Sargent & Co., Worcester, Mass. 10

Door Hangers, House and Barn.

Cochran Iron Foundry and Machine Co., Cohoes, N. Y. 7

Door Hangers.

Cochran Iron Foundry and Machine Co., Cohoes, N. Y. 7

Door Hangers.

Cochran Iron Foundry and Machine Co., Cohoes, N. Y. 7

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Cochran Iron Foundry and Machine Co., Cohoes, N. Y. 7

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Door Hangers.

Cochran Iron Foundry and Machine Co., Cohoes, N. Y. 7

Door Hangers.

Cochran Iron Foundry and Machine Co., Cohoes, N. Y. 7

## Forgings, Iron and Steel.

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Foundry Supplies.

Emrick J. A. & Co., Philadelphia, Pa. 3

Paxson J. W. & Co., Philadelphia, Pa. 45

S. Obermayer Foundry Supply Mfg. Co., Cincinnati, O. 45

Friction Clutches.

Rates H. N., Boston, Mass. 49

Fronts and Rosettes.

National Front Co., Knoxville, Tenn. 13

Fruit and Lard Presses.

Penn. Ind. Co., Reading, Pa. 34

Furnace Hoists.

Stokes & Parrish Machine Co., Phila. Pa. 50

Furnace Lamps.

Taylor & Boggs Dry Co., Cleveland, O. 10

Gates, Folding.

Composite Iron Wks. Co., 93 Church, N. Y. 3

Glass Cutters.

Andrews Thos. J., Philadelphia, Pa. 14

Gin Ribs, &c.

Chas. F. Lombard, Augusta, Ga. 4

Grain and Seed Separators.

Newark Machine Co., Columbus, O. 13

Grinders and Polishers' Supplies.

Union Stone Co., Boston, Mass. 44

Grindstones.

Berea & Huron Stone Co., Cleveland, O. 39

Grindstones.

Ohio Grindstone Co., Cleveland, O. 39

Grindstones.

Wood, Walter R., 283 and 285 Front, N. Y. 39

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray, N. Y. 8

Hammers.

Buffalo Hammer Co., Buffalo, N. Y. 51

Hartford Hammer Co., Hartford, Conn. 43

Hammers, Steam.

Bradley & Co., Syracuse, N. Y. 52

Hand Force Pumps.

Union Mfg. Co., 96 Chambers, N. Y. 7

Handles, Shovel, Spade, &c.

Brower John, 81 Murray, N. Y. 4

Hardware Comm'n Merchants.

Field Alfred & Co., 93 Chambers, N. Y. 10

Graham J. H. & Co., 113 Chambers, N. Y. 8

Haines, Samuel, 42 Chambers, N. Y. 8

Newhall H. B. Co., 105 Chambers, N. Y. 38

Hardware Importers.

Field Alfred & Co., 93 Chambers, N. Y. 10

Hardware Manufacturers.

Enterprise Mfg. Co., Philadelphia, Pa. 46

Stanley Works, New Britain, Conn. 43

Shepard Hardware Co., New York, N. Y. 43



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Will sell cheap for cash and time payments, or will exchange for real estate or lumber, any part of the

- 1 Train of Lauth's 24 in. 3-high Rolls.
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- 1 Muck Shear.
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- 1 Scrap Shear and Engine.
- 1 Large Startvnt Blower and Pipe.
- 1 Furnace Plates for 4 Charcoal Fires, incling Valves &c.
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- 1 Large Boiler, fire-box metal, 26 ft. by 48 in. or 44 in.
- 1 Small Boiler, 26 ft. by 47 in.
- 1 Track Scale, Wagon Scale, Mill Scales. Tools, Tram - ways, Buggies, Patterns, &c.

Address  
PLATE & BAR MILL CO.

Room 7, 130 Dearborn St., Chicago, Ill.

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# SCRAP IRON

## FOR SALE.

300 tons R. R. Spiral Spring Steel.  
200 " " R. R. Elliptic Spring Steel.  
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500 " Mixed and Flow Steel.

25 " New "Eagle" Horse Shoe Bar.

Also a large assortment of new and second-hand Machinery, Tools and Belting. Correspondence solicited.

**A. LIEBERMAN,**  
Nos. 1443 and 1501 to 1507 State St., Chicago, Ill.

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**For Sale.**

One 50-foot Air Hoist for Blast Furnace, air cylinder 30 inches internal diameter, with ne-

**For Sale.**

Second-hand  
**DROPS and LIFTERS.**

**BEECHER & PECK,**  
Lock Box 222, New Haven, Conn.

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**For Sale.**

its 1 1/2 in. x 10 in.; geared eight to one; 2200 lb. Fly-Wheel on Pinion Shaft; all complete on a heavy bed-plate; requires very little foundation; driven by 8 x 12 inch Engine, attached. A

**For Sale.**

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New first-class Machine Tools at very low

Engine Lathes with 6 and 8 foot beds, 16-inch

ing.  
18-inch swing, with 8, 10 and 12 foot beds,  
15-inch swing, with 12½-foot bed,  
16, 27 and 28 inch swing, with 12½-foot beds.  
For description, cuts and prices, address  
JOS. B. REED,  
Cairo, Ill., U. S. A.

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**The Hardware Stock of the late C. I. Wetmore**

now for sale at a bargain. The location is very best and has been known as a hardware and for 40 years. The stock is clean and fresh—old goods and comprises Shelf and Builders' hardware, stoves, a small line of first-class Agricultural implements, House-Furnishing goods. This is a grand opportunity to secure a well-established and money-making business, as the designed are determined to dispose of this stock at once. Address

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## Wholesale Hardware Auctioneers.

53 Chambers and 65 Beade Sts., N. Y.

**EYER, KINGSLAND & CO.,**

**Wholesale Auctioneers,**  
**10 Warren St., New York.**  
 Regular sales of Hardware, Cutlery, &c. Sales

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Man who solicits the Hardware trade can  
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CHAMPION SAFETY LOCK & NOVELTY CO  
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## Wanted.

tion as Chemist in an Iron or Steel works  
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Phosphorus, Manganese and Carbon in Iron Steel. Can furnish balance and necessary ratios for work. Address W. M. GIBSON, Portsmouth, Ohio

**WANTED** TRAVELING SALESMAN for Builders' Hardware, &c., to carry sample and take orders

First-class article; weight of sample 12 oz.  
 Address at once E. W. MARTIN,  
 139 Vall Ave., Lansingburgh, N. Y.

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# Trade Report.

## New York Iron Market.

**American Pig.**—In all quarters a very light business is reported. Orders are confined to small lots, and even in these the demand is not up to the aggregate of former weeks. It is reported in some of the newspapers that there is a weakening tendency, notably in No. 2 Foundry. We have endeavored to trace these reports to some authoritative source, but are unable to confirm them. The furnace agents generally insist upon the figures quoted; we are unable to detect any greater pressure or larger concessions on the part of outside brands. We continue to quote standard brands of Lehigh and North River Irons, tidewater delivery, as follows: No. 1 X Foundry, \$18 @ \$19; No. 2 X Foundry, \$17 @ \$18; Gray Forge, \$16 @ \$17. The outside figure is asked for special brands. Outside brands sell for 50¢ @ \$1 less than our quotations.

**Scotch Pig.**—The market is quiet. The war excitement in Europe is not looked upon as being liable to curtail the imports of Scotch Pig to any extent. What has been bought during the past year has been taken because a certain amount of Scotch Pig is absolutely needed by some foundries. Even if there should be an advance, the consumption, small as it is, is expected to go on. Nominal quotations for 5 and 10 ton lots are as follows: Coltness, \$21.50 to arrive; Gartsherrie, \$21 to arrive; Shotts, \$21.50 to arrive, \$22 from yard; Langloan, \$21.50 to arrive, \$22 from yard; Carnbroe and Glenargie, \$19 @ \$19.50 to arrive, and \$20.50 from yard; Summerlee, \$20.50 to arrive; Dalmellington, \$19 @ \$19.25 to arrive; Eglington, \$18 @ \$18.50 to arrive; Clyde, \$19 to arrive. For larger lots we quote, nominally, Coltness, \$21.

**Bessemer Pig and Spiegeleisen.**—We hear of no transactions and quote nominally \$16 @ \$18 at mill for Domestic Bessemer Pig and \$25.50 @ \$26 for Spiegeleisen. The furnace of the Edgar Thomson Works is temporarily out of blast.

**Bar Iron.**—The market is in a peculiar position. Quite a number of small orders are being received, but many of the mills are anxious for business, and quotations fluctuate a good deal. Occasionally very low offers are being made for good Irons, and yet fair prices are paid for recognized brands. We quote for delivery here in round lots: Common Iron 1.45¢ @ 1.6¢, and Refined Iron 1.75¢ @ 1.9¢, store prices being 1.55¢ @ 1.8¢ and 1.85¢ @ 2¢ respectively.

**Structural and Shaped Iron.**—Although a number of large contracts are pending, no business of any magnitude has been closed during the week. Angles are selling in round lots at 2¢ @ 2.2¢, the lower figure being occasionally shaded, while Tees can be purchased at 2.25¢, delivered in round lots. Store quotations are 2.2¢ @ 2.4¢ for Angles and 2.4¢ @ 2.5¢ for Tees. American Beams and Channels are 3¢ from dock for all orders. Foreign Beams, in round lots, are quoted 2.5¢ @ 2.6¢ for Belgian, and 2.6¢ @ 2.8¢ for German, no recent business being reported. It is not believed that an advance in freights growing out of complications abroad would affect the ability of the importers to compete. At present freights from Antwerp are 12¢. Even if they should go to 20¢ the freight would be only 2¢ @ 2¢.

**Plates.**—There has been some business in Steel Boiler Plates. In Iron Plates the business is irregular from week to week, and prices depend upon the necessities of the individual mills. Usual prices of Iron Plates are as follows: Common or Tank, 2¢ @ 2.15¢; Refined, 2½¢; Shell, 2½¢ @ 2¾¢; Flange, 3½¢; Extra Flange, 4¢ @ 4¼¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2¾¢ @ 3¢ on dock; Boiler, 3½¢ @ 3¾¢ for Shell, 3¾¢ @ 4½¢ for Flange, and 4½¢ @ 5½¢ for Extra Flange and Fire-Box.

**Sheet Iron.**—The spring trade thus far has been a severe disappointment, and there is a disposition to lower prices of the best makes which are beginning to feel the strain of the competition of inferior kinds. We quote No. 24 2.9¢ @ 3.9¢, according to quality and finish.

**Merchant Steel.**—There is little doing. Quotations for the range from Ordinary to Good grades are as follows: American Tool Steel, 7¼¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2½¢ @ 3¢; Open-Hearth Machinery, 2¼¢ @ 3¼¢, and Bessemer Machinery, 2½¢ @ 2¾¢; English Tool, 13½¢ @ 15½¢.

**Steel Rails.**—No transactions of any magnitude have been made, although there are unconfirmed reports afloat. Some of the mills show a disposition to demand better figures. There are inquiries in the market which will speedily test the question whether a higher range will prevail. Meanwhile we quote nominally, \$26.50 @ \$27 at mill. Some business has been done during the week in Steel Street Rails at private terms.

**Steel Wire Rods.**—There have been no transactions. We quote \$41 @ \$42. Wire Billets are worth \$32.50 @ \$35 at mill.

**Old Rails.**—Old Rails are not as strong as they have been. The best bids do not go

higher than \$17.25, while holders are still asking \$17.50. No business has been done during the week.

**Old Wheels.**—Aside from sales of small lots at \$16, we hear of no transactions. We quote, nominally, \$16.

**Scrap.**—Spot stocks are very small, and are quite firmly held. We learn that a large Eastern mill, unwilling to come into this market, has purchased considerable supplies at New Orleans. We quote, nominally, \$18.50 @ \$19 from yard for No. 1.

**Rail Fastenings.**—There have been some transactions at private terms. Quotations for large lots are 2.6¢ @ 2.65¢ for Bolts and Square Nuts; 2.8¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.65¢ @ 1.7¢ for Splice Bars. Railroad Spikes are quoted 1.85 @ 1.9¢, which is shaded for round lots.

Messrs. Ely & Williams, 480 Pearl street, Eastern selling agents of Brown & Co.'s "U. S." Bar Iron, have issued a circular quoting as follows:

Rounds and Squares.	Per lb., cash.
¾ in. to 2 in.	6¢
2½ in. to 3½ in.	6½¢
¾ in. and 1½ in.	6½¢
1 in. to 1½ in.	6½¢
1½ in. to 2 in.	6½¢

Flat Bars.	Per lb., cash.
1 in. to 6 in. x ¾ in.	6¢
1½ in. to 6 in. x 1½ in.	6½¢
¾ in. to ¾ in. x ¾ in.	6½¢

Ovals.	Per lb., cash.
¾ in. to 1½ in.	6½¢
1½ in. to 1½ in.	6½¢

Half-Ovals and Half-Rounds.	Per lb., cash.
¾ in. to 1½ in.	6½¢
1½ in. to 1½ in.	6½¢

Bands.	Per lb., cash.
1 in. to 6 in. x ¼ in. and 5-16 in.	6½¢
1 in. to 6 in. x ¾ in. and 5-16 in.	6½¢
1 in. to 6 in. x ¾ in. and 5-16 in.	6½¢

It may be of interest in this connection to add the following analysis of "U. S." Bar Iron:	
Combined Carbon.....	.006
Graphite.....	Minute trace
Silicon.....	.032
Sulphur.....	.001
Phosphorus.....	.001
Manganese.....	.071
Copper.....	.003
Minute traces of other matter, loss, &c.....	.018
Pure Iron.....	99.710

Tensile strength exceeds 62,000 lb. per square inch.

## Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, April 14, 1885.

**Pig Iron.**—The market remains in the same dull and uninteresting condition as reported for some weeks past, with but little prospect of change either for better or worse. Sales are exceedingly slow, but deliveries on old contracts prevent accumulations on furnace banks and enable sellers to maintain their prices. The impression seems to be that consumption is quite equal to production, so that, even if there is a temporary falling off in sales, it will make no difference so long as consumption can be maintained. It would be more satisfactory, nevertheless, to see consumers coming forward with orders, but, as a matter of fact, there is an increasing disposition to postpone purchases to the latest moment possible. It might have been supposed that the events of the past couple of weeks would have a tendency to start up business, but it has not done so, although most people see great possibilities in the near future. But in dealing with things as they really are there is no question that the demand is slow and unsatisfactory, and prices at best not more than steady. Some grades are positively weak, but for such brands as are generally in demand the market may be called quiet and unchanged. What the ultimate outcome will be cannot be foreseen with anything like distinctness, but in the meantime no one seems like buying anything beyond what is required for use within the next 30 or 60 days. Sellers are anxious for business, but, as a rule, they are holding to firm quotations, although there are some exceptions, chiefly among those whose brands are not thoroughly established. Large consumers can do as well as, if not better than, at any time since the first of the year, so that if there is any change at all it is certainly not for the better. Sales during the week have been in small lots at \$16, \$17 and \$18, delivered, for the three grades of standard brands; 50¢ @ \$1 more for special brands, and \$15, \$16 and \$17, ex-ship, for Alabama and Tennessee Irons.

**Foreign Iron.**—There is nothing doing in the way of new business for shipment. Spot lots of 20 cwt. Spiegel sell at about \$26, and Ferromanganese at \$50 for 62 cwt., or \$72 for 80 cwt. Bessemer is nominally at about \$19.50, asked, but there is no probability of business being done at that figure, except in very small lots.

**Blooms.**—Sample lots of Foreign Steel Blooms and Slabs are being called for, but prices are very little use without a precise statement of quality. Soft Basic Blooms may be quoted at from \$37.50 to \$39, according to analysis; Siemens-Martins at from \$40 to \$42. Domestic Blooms are quoted at from \$31 to \$32, delivered, for Nail Plate and \$35 @ \$36 for Plate and Sheet Blooms. Other descriptions are extremely dull and offered at about as follows: Charcoal Blooms at \$50 @ \$52; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$35 @ \$36; Northern Ore Blooms, \$35.

**Muck Bars.**—There is a fair demand, but no change in prices, which range from \$26.50 to \$27.50, delivered, according to quality.

**Bar Iron.**—The demand shows no material change from what it has been for

several weeks past, and, on the whole, may be called dull and disappointing. Most of the mills manage to run from a half to two-thirds of their capacity, but that appears to be all the business that can be secured, and even then prices are shaved down to cost, and in some cases below cost, if the article is what it is represented to be. There is nothing in sight upon which to base any definite ideas of improvement, although at this season improvement is generally expected, and, after such protracted dullness as we have had, it ought to come soon, if coming at all. Meanwhile prices are irregular, varying according to quality, quantity, specification of sizes, &c. Common Iron at 1.5¢ @ 1.6¢; good Medium at 1.65¢ @ 1.75¢, and strictly first-class Refined at 1.8¢.

**Plate and Tank Iron.**—Business has been slow and unsatisfactory for some time past, and as yet there are no indications of improvement. The demand is almost exclusively for small lots, and barely sufficient to keep the mills at work, even on the limited output of the past three months. Prices are unchanged, but on desirable orders concessions are made on the asking prices, which are as follows: Ordinary Plate, 2¢; Tank, 2¢ @ 2.1¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Flange, 3.5¢ @ 3.75¢; Fire-Box, 4¢ @ 4.25¢.

**Structural Iron.**—New business is extremely scarce, and during the week manufacturers have made very few additions to their former contracts. Inquiries are of a somewhat languid character, and at the moment the outlook is far from encouraging. Prices are unchanged, but on large orders could be shaded a trifle from the asking figures, which are about as follows: 2¢ @ 2.1¢, delivered, for Angles, 2.1¢ @ 2.15¢ for Bridge Plate, 2.3¢ @ 2.4¢ for Tees, and 3¢ for Beams and Channels.

**Sheet Iron.**—There is only a moderate demand, but prices for the best makes are steadily held at about the following quotations for small lots:

Best Refined, Nos. 26, 27 and 28.....	34¢
Best Refined, Nos. 18 to 25.....	34¢
Common, ¼¢ less than the above.....	5¢
Best Bloom Sheets, Nos. 26 to 28.....	45¢
Best Bloom Sheets, Nos. 18 to 21.....	45¢
Blue Annealed.....	2.5¢
Best Bloom, Galvanized, discount.....	60¢
Second quality, discount.....	62½¢
Common, discount.....	65¢

**Wrought-Iron Pipe.**—There has been a little more doing during the past week, and on the whole a fair amount of business has been transacted, condition of the weather being taken into account. Here and there a good-sized order is reported, but in most cases the demand is for limited quantities for immediate use. There is a good deal of complaint among manufacturers concerning the low and unremunerative prices at present ruling, but it is difficult to see how an improvement can be brought about so long as business is competed for as sharply as it is at the moment. For small lots quotations are about as follows: Butt-Welded Black Pipe, 45 @ 47½¢; Lap-Welded Black, 65 @ 67½¢; Butt-Welded Galvanized, 35 @ 37½¢; Lap-Welded Galvanized, 45 @ 47½¢; Boiler Tubes, 57½¢ @ 60¢.

**Nails.**—The market is in pretty much the same condition as has been noted for some few weeks past. In a quiet way a considerable amount of Nails are being sold, and the market generally is reported steady at unchanged prices—say \$2.30 for Iron Nails in small quantities, with concessions of more or less importance on carload lots. Steel Nails are quiet at about \$2.40 @ \$2.45, according to quantity required.

**Steel Rails.**—There is more inquiry for large lots, but it is difficult to arrange terms that would be mutually satisfactory. Sellers require strict cash or its equivalent, and those who can meet these conditions expect to place their orders at figures below what is usually asked. Small lots are quoted at from \$27.50 to \$28 at mill, and \$27 is said to be a very inside rate for even the most desirable orders, notwithstanding the much lower quotations published in New York. Sales in this market during the week are all said to have been at from \$27.50 upward; market steady.

**Old Rails.**—There is no change from last week; holders are as firm as ever, but buyers are very reluctant to advance their bids. Sales have been made at \$18.50, delivered a short distance in the interior, with \$18.75 @ \$19 bid for deliveries in the vicinity of Pittsburgh. Nominal prices are \$17.75 @ \$18, Philadelphia, but there is nothing on the spot at the moment.

**Old Material.**—Prices are firmer, and with very limited supplies the tendency is toward higher figures. Quotations are about as follows, with sales chiefly at the outside figures: No. 1 Wrought Scrap, \$13 @ \$19; No. 2 do., \$12.50 @ \$13.50; Horse Shoes, \$22.50 @ \$23; Turnings, \$13.50 @ \$14; Old Car Wheels, \$15.50 @ \$16; Old Steel Rails, \$15.50 @ \$16; Fish Plates, \$22.50 @ \$23; Cast Scrap, \$13.50 @ \$14; do. Turnings, \$9.50 @ \$10.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., April 14, 1885.

The most remarkable matter to note is the continued cold and unseasonable weather, and thus far the farmers in this section of the country have made little or no progress with their spring work. In regard to the condition of the market for manufactured goods, there has been no important change during the past week. The general Iron trade does not improve much, and it is far

from being what it should be at this particular time. Not only is the demand light, but prices are unremunerative; the latter is the most discouraging of the two. It is very evident that Bessemer and Open-Hearth Steels are largely taking the place of Iron, and even Iron manufacturers, will have to turn their attention to the making of Steel. This appears to be the age of Steel. The latest in this line is the Steel Nail, which, it is evident, is coming into general use. There is some talk of having the Western Nail Association have its headquarters at Wheeling the coming year. The next meeting of the association takes place at Wheeling, on Wednesday week, at which time the election of officers for the ensuing year will occur. In labor circles there has been nothing new developed the past week. It is expected that the 6000 Coal miners in the Monongahela Valley will probably generally get to work this week. As there is a good stage of water in the river for getting out Coal it is being shipped away about as fast as loaded. There is still a good deal of competition between the Pittsburgh and Kanawha River operators for the Cincinnati market, and while the former have the best quality of Coal, the latter have the advantage of a much shorter distance to transport, and then they are not subject to lockage.

**Iron Ore.**—Those of our brokers making a specialty of the Ore business report it as being slow, although all that can be expected in view of the depressed condition of the Iron trade. Some few pretty good-sized contracts have been made, but furnacemen, as a rule, are buying only as their immediate wants require. Latest advices from Cleveland report trade there quiet and prices unchanged. Freight from Cleveland to Pittsburgh, \$1.25 per ton.

**Pig Iron.**—Commission men continue to make discouraging reports, although business is all that can reasonably be expected. The consumption is increasing somewhat, but it is far below what it usually is at this season of the year, and prices, instead of improving, are as weak as ever. There is still a good deal of hypochondria on the market, some of which is being pressed, and while this continues there is not much show for any improvement in price. Consumers, as a rule, do not take well to this hypochondria, which consists of different qualities and brands—good, bad and indifferent—but they make use of the same in buying Iron with which they are familiar, and not unfrequently with success. Even for No. 1 city-made Irons, which always have the preference in our own market, prices have gone off from 25¢ to 50¢ per ton within the past few weeks. Quotations may be fairly given as follows:

No. 1 Neutral Gray Forge.....	\$15.25 @ \$15.50, 4 mos.
No. 2 Neutral Gray Forge.....	14.50 @ 14.75, 4 "
All-Ore Forge.....	16.00 @ 16.25, 4 "
White and Mottled.....	14.00 @ 14.50, 4 "
No. 1 Foundry.....	17.00 @ 18.00, 4 mos.
No. 2 Foundry.....	16.00 @ 16.50, 4 "
Cold-Blast Charcoal.....	25.00 @ 27.00, 4 "
Bessemer Iron.....	17.50 @ 18.00, 4 "

It requires best brands to bring outside quotations. It is said that Bessemer Iron has been sold as low as \$17, cash. It is not likely that furnace companies will be able to declare very large dividends at the prices above quoted.

**Muck Bar.**—There appears to be no demand whatever; quoted nominally at \$27, cash, but could no doubt be bought for \$26.50.

**Manufactured Iron.**—There is no improvement in demand, and while hopes are entertained that there soon will be, the outlook is not particularly encouraging. However, the advent of some good, seasonable weather, which cannot surely be much longer delayed, may place a very different aspect on the outlook. There is sometimes a very sudden and unexpected change for the better, and such a thing is not improbable within the next few weeks, although the indications at present do not point very strongly in that direction. We continue to quote prices—that is, for first-quality Iron—on a basis of 1.65¢ @ 1.75¢, 60 days, 2¢ off, for Bars. But very few, if any, of the mills are running full; many are only working half time, while others again are doing nothing.

**Nails.**—There has been no change in the situation during the past week. Iron Nails continue very dull for the season, and the demand for Steel Nails is hardly as brisk as it was a month ago. Prices remain unchanged at \$2.25, 60 days, 2¢ off for cash, and a rebate of 10¢ per keg on carload lots and upward. Thus far Shoenberger & Co. have been the only firm in Pittsburgh to make Steel Nails, but it is intimated that Chess, Cook & Co. and Zug & Co. will shortly commence to make the same. It looks very much at present as if the Steel Nail was destined sooner or later to supplant the Iron article, although people are not yet fully convinced that the former is superior to the latter.

**Wrought-Iron Pipe.**—There has been little or no change in the situation since our last report, although manufacturers expect an improvement with the advent of more seasonable weather. No change in prices, which, it is believed, are as low as they are likely to go. There is no room for any further cutting. Discounts on Black Butt-Welded Pipe, 1¼-inch and smaller sizes, 50¢; Galvanized do., 40¢; on Black Lap-Welded Pipe, 1½-inch and larger sizes, 67½¢; Galvanized do., 50¢. On Selected Pipe, or Pipe cut to specified lengths, the discount is 5¢ less than the rates above quoted. Two-inch Oil-well Tubing, 10¢ per

foot, net; 5½-inch Oil-well Casing, 36¢ per foot, net.

**Steel.**—For the highest grades of Steel the demand continues, but mills making Open-hearth and Bessemer Steel are pretty well employed. Some of the latter have all they can possibly do. Best brands of Refined Cast Steel remain unchanged at 9¢ per lb. Crucible Machinery, 4¼¢; Open-hearth, 3¢ Nail Slabs, \$29.50 @ \$30 per ton, delivered on cars at works of maker.

**Steel Rails.**—No sales have been reported here recently, in the absence of which we continue to quote nominally at \$27, cash, on cars at works. As but few new railroads are talked of, the outlook is not very encouraging, and in addition to a light demand there is little or no margin for profit at the price. There is a report in circulation of some Western road which intends to take up a lot of 10,000 tons that have been down but little over two years, and hold the makers, who guaranteed the same for five years, for the difference.

**Old Rails.**—Continue scarce, and for immediate delivery prices are firm, notwithstanding the demand is not pressing. The most of the inquiry appears to be from consumers in the Shenango and Mahoning valleys. For immediate delivery Old Iron Rails are quoted at \$20 @ \$20.50, and Old Steel at \$17 @ \$18. Owing to the continued cold weather there have been but few Old Rails taken up as yet.

**Railway Track Supplies.**—The demand for everything in this line continues light for the season, and the prospect for an early improvement is not very bright. Spikes are quoted at 1.9¢ @ 2¢, delivered; Splice Bars, 1.6¢ @ 1.7¢; Track Bolts, 2.35¢ @ 2.4¢ with Square and 2.5¢ @ 2.6¢ with Hexagon Nuts.

**Crop Ends.**—There is considerable inquiry for Steel Rail Ends, and in this market they are very scarce; quoted, in the absence of sales, at \$18.50 @ \$19; Steel Bloom Ends, \$17.75 @ \$18.

**Scrap.**—There is rather more doing, but prices remain unchanged. No. 1 Wrought \$17 @ \$18, net ton, outside figure for selected; Wrought Turnings, \$13 @ \$15; Old Car Axles, \$24 @ \$25; Cast Borings, \$11 @ \$12, gross ton; Old Car Wheels, \$16 @ \$17.

**Coke.**—Blast-Furnace remains unchanged at \$1.20 per ton, free on cars at ovens. Furnacemen complain at the increased cost of Coke, but Coke men say that at the price now ruling there is very little margin for profit.

**Window Glass.**—Trade continues dull, but manufacturers are hopeful of an improvement later on in the season. Prices remain unchanged.

## Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., CHICAGO, April 13, 1885.

**Hardware.**—There is nothing new that can be added to the statement regarding the Hardware market for the week under review that has not been mentioned in the last two reports. Jobbers have all that they can attend to, and report that their business is running along in a very smooth and satisfactory condition, so far as demand goes. The implements most serviceable at this season of the year are having the largest call. There is an increased demand for Builders' Hardware, Carpenters' Tools and Axes. Inquiries for Tin Plate Roofing are in advance of desire to purchase, though taken with a view of posting on quality and price. Lumber merchants report heavy sales and active demand, and from all appearances building interests throughout the West will be considerably in advance of what they were last year, which gives great encouragement to the Hardware merchant and causes him to feel more liberal in buying goods. Prices continue fairly steady, with the usual amount of cutting on special articles for the purpose of obtaining new customers for the respective houses. The concessions that are being made at present are said to be chiefly upon the basis of competition, and not with a view of further reducing prices, which are now much below remunerative figures on many of the articles sold by jobbers in Hardware.

**Barb Wire.**—There is no change in the condition of the Barb-Wire market. Jobbers are contending with the difficulty of obtaining Two-Point Wire, which seems to be their only complaint at the moment. An inquiry for Two-Point Wire at one of the largest jobbing houses in this city during the week brought out the statement that they had but 10 Spools of that class of Wire in the house, and orders had to be taken subject to their ability to obtain it from the factories. We renew our quotations on Painted Four-Point, 3¼¢; Four-Point Hog Wire, 4¼¢; Two-Point Cattle Wire and Two-Point Hog Wire, 4¼¢, with 1¢ additional for Galvanized, and ¼¢ less in carload lots on both classes. Prices regular and firm, and cheap Wires and on Specials from ¼¢ to ¾¢ higher than quotations.

**Nails.**—The greatest activity in the Nail market is for Steel Nails, the demand for which is considerably in excess of the ability of some of the jobbers to supply, while others handling a different make of Nails do not report their demand quite so favorable. The call for Iron Nails during the week was not quite so strong as several weeks ago. It is stated that in one or two cases small lots have been sold at the same price as carload lots in this market, but







## General Hardware.

At these discounts it was seen that the Dayton Screws were considerably lower than those of the other companies, and the trade in canvassing the situation awaited with interest developments as to how this action would be met, or whether it would be met at all by any further concession. Many expressed the opinion that it would be disregarded, and the Dayton Company allowed to fill up on orders at the price they have made,

We think the recent change in prices will prove beneficial to all concerned. Our reason for this opinion is that it will have a tendency to check competition, as we do not think there is any inducement for new manufacturers to enter the field, and it will also tend to bring nearer together in price outsiders and insiders. In our judgment racks would have been selling at present prices within a month, for the trade was holding off, waiting coming events, while small manufacturers that must sell would have gone lower and lower. The trade are now generally satisfied and will buy liberally. Friends of the combination will stick, while those not friendly or not able to buy the quantities for rebate will buy outside. There is enough of both these classes to satisfy at present the Central Company and outsiders. We shall sell at as near combination prices as possible, and in no case will we undersell their lowest rebate.

The Marlin Fire Arms Company, New Haven, Conn., have lately introduced in the line the "Union Hill Target Rifle," Nos. 8 and 9 on their list, which they report meeting with favor. The 32 caliber for 50 yards shooting they refer to as something entirely new. The manufacturers express the opinion that the time of large bore target work and also for many sporting purposes is past, and that with less powder lead, but with the proper adjustment of the trigger to the other, a gain is made in various ways, especially in the matter of economy, so far as ammunition is concerned, and also the diminished recoil. Up to 500 yards they say that the new 32 will do as well as the larger size and range that covers a large portion of all Rifle work. The moderate price at which they are sold (No. 8 listing at \$50 and No. 9 at \$33) is alluded to as placing them within easy reach of sportsmen generally. They are also about to put on market a new article in the Marlin Rifle, to which we shall direct the attention of our readers in another issue.

Merchant Bar Iron, assorted Orders, card  
 15  
 100 lb Box Steel, 3, 13-10 and  $\frac{3}{4}$  x Nos. 12, 13 and  
 14, with bent ends, per lb. 35¢  
 100 lb Box Steel, 3, 13-10 and  $\frac{3}{4}$  x Nos. 12, 13 and  
 14, cut to length, per lb. 37¢  
 100 lb Box Steel, 3, 13-10 and  $\frac{3}{4}$  x Nos. 12, 13 and  
 14, cut to length, punched and countersunk,  
 per lb. 39¢  
 100 lb T Rail, 12, 10 and 20 pounds to the yard,  
 per lb. 18-100  
 100 lb Flow Anvils, 3, 3 $\frac{1}{2}$  x 4, 4 $\frac{1}{2}$  x 5 in. long, per lb. 46  
 100 lb Head Spikes, 2 $\frac{1}{2}$  x 3 $\frac{1}{2}$  in. per lb. 31-100  
 100 lb. 16 lbs. 20 lbs. 25 lbs. 30 lbs.  
 100 lb Bars and Bolts, per set. 35¢ 27¢ 35¢  
 100 lb Rail, 13 $\frac{1}{2}$  x 4, punched and countersunk,  
 per lb. 37¢

Stretcher, Stay and Fifth, Black.

per lb.....	$\frac{36}{49}$	$\frac{5-16}{5.45}$	$\frac{3}{64}$
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The Penn Hardware Company, of Reading, in addition to their usual line of goods, are now bringing out two specialties to which they invite special attention, viz., Whittemore's Simplicity Apple Parer, Corer and Slicer, and Whittemore's "Boss" Fruit and Lard Press, illustrations of which can be seen in their advertisement on page 34.

The Diamond Roller Skate Company, Richmond, Ind., are so adding to their manufacturing facilities as to enable them to largely increase their output.

The Pope Mfg. Co., Boston, have issued their spring catalogue, April, 1885, a tastefully-printed pamphlet of 52 pages, and illustrated with nearly 70 engravings of the Columbia Bicycles and Tricycles and sundries for the season just opened.

George E. Lockwood & Co., 155 North Second street, Philadelphia, have recently brought out a new horseshoe-shaped Illuminated Match Safe, and also an improved Flue Stopper. The Match Safe is made both in brass and decorated tin. The Flue Stopper has been improved by the addition of a ventilating attachment, but can also be had in the old style without ventilators. These Stoppers are decorated with chromos, and are made up in a variety of colors, &c.

The Acme Shear Company, Bridgeport, Conn., call attention to the fact that their "Acme" Shear, ornamental handle, patented July 17, 1877, has been imitated and been offered on the market under similar names, their labels, color and shape of box being also closely copied, while the goods are referred to as inferior in every way.

The Crescent Roller Skate Company, Richmond, Ind., expect shortly to put on the market an Improved Club Skate, which, among other features, will have their Self-Oiling Wheel.

The Nantasket Roller Skate Company, Lowell, Mass., have just removed into a new factory, corner Market and Worthen streets, where they will be able to turn out double the amount of goods they could from their former factory. They will soon issue a new catalogue.

Hobart B. Ives has formed a copartnership with Frederick F. Andrews, and the firm becomes Hobart B. Ives & Co. In making this announcement reference is made to the increased facilities and the intended addition of new goods to the line of manufacture.

The Conner & Mather Mfg. Co., Richmond, Ind., although rather long in having their Skate put on the market, report a good and increasing demand. Their capacity is now 150 pairs per day, which will be increased to 300 pairs in about two weeks.

The Holmes & Edwards Silver Company, Bridgeport, Conn., have recently put in their factory a new 100-horse-power engine.

C. D. Leet, Bridgeport, Conn., manufacturer of Vises, is about to introduce a new Pipe Vise which will have special features.

A. A. Weeks, 82 John street, New York, issues circulars relating to the specialties of which he is the manufacturer, among which are the following: New York Clothes Line Holder, Security Letter Box, Patent Convex Fluting and Smoothing Iron, American Sash Holder and Lock, and Weeks's Grape, Fruit and Flower Picker.

W. N. Packer, Benson Block, corner of Canal and Michigan streets, Cleveland, Ohio, has recently put on the market a Roller Skate called "Packer's Practical," for which special claims are made in a circular issued giving a description of it.

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## Coal Market.

The Coal-trade headquarters in this city are very quiet, the orders received being in no sense oppressive, either as to number or size. In truth, the spring opening prices have very little spring in them. Trade apparently is waiting until navigation is wholly unobstructed. Quotations range about as follows, alongside: Stove, \$4.15; Egg and Broken, \$3.60; Chestnut, \$3.55; Lykens Valley, f.o.b. at Elizabethport, Broken, \$5.25; Egg, \$5.50; Stove, \$5.75; Nut, \$5.50. Although circular prices as a rule only approximate the prices realized, the following comparison of opening prices for four years has some significance:

	Lump.	Grate.	Egg.	Stove.	Nut.
1882.....	\$3.50	\$3.50	\$3.80	\$4.00	\$3.50
1883.....	3.50	3.50	4.00	4.20	4.20
1884.....	3.80	3.80	3.80	4.15	4.00
1885.....	3.40	3.40	3.40	4.00	3.75

Bituminous remains, as for some time past, at \$3.25, alongside, with business quiet. The total amount of Anthracite mined

compared with 5,857,654 tons for the same period last year, a decrease of 556,388 tons. The total amount of Bituminous sent to the Eastern markets thus far in the year 1885 is 1,244,853 tons, compared with 1,186,488 tons for the corresponding period last year, an increase of 58,365 tons.

The extension of the Pennsylvania Schuylkill Valley Railroad to the Anthracite Coal regions will be built during the present year. A large number of men are now engaged in grading upon several sections of the railroad between Hamburg and Pottsville.

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## Metal Exchange.

The following transactions have been recorded at the Metal Exchange during the week:

TUESDAY, April 9.

10 tons Tin, April.....	\$0.1735
10 tons Tin, March.....	1735
10 tons Tin, April.....	1735

FRIDAY, April 20.

10 tons Australian Tin, April.....	\$0.173
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**L. COES' Genuine and Mechanics, PATENT Screw Wrenches**  
MANUFACTURED BY  
**L. COES & CO.,**  
Worcester, Mass.  
ESTABLISHED IN 1839.

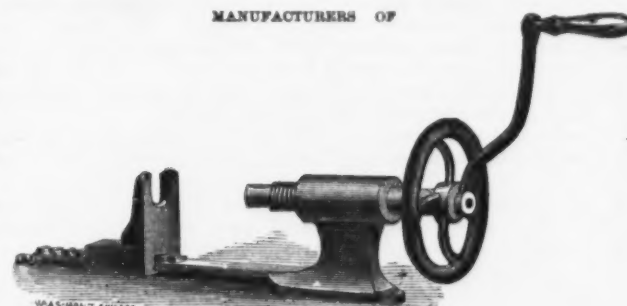



Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped

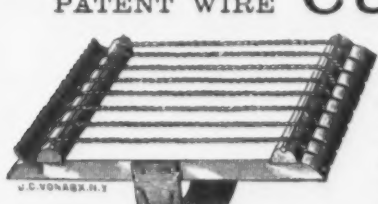
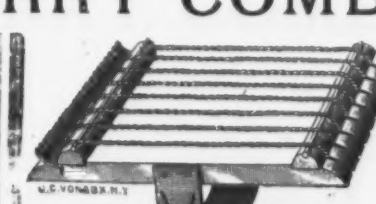
**L. COES & CO.,**  
Worcester, Mass.  
Warehouse,  
97 Chambers and 81 Reade Sts.  
NEW YORK.  
**DURRIE & McCARTY,**  
Sole Agents.

**NIMICK & BRITTAN MFG. CO.,**  
PITTSBURGH, PA.,  
**BUILDERS' FINE HARDWARE,**  
RIM AND MORTISE DOOR LOCKS WITH  
**BURGLAR-PROOF ATTACHMENT.**  
GENUINE BRONZE AND IMITATION BRONZE KNOBS, &c., &c.  
Mathes' Patent Burglar-Proof Sash Locks.  
**PADLOCKS.**  
TEA, COUNTER, UNION AND PLATFORM SCALES.  
Catalogues and Lists furnished on application.  
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**ILLINOIS IRON & BOLT CO.,**  
Nos. 20 to 26 Main Street,  
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Blacksmiths' Tools, Thimble Skeins,  
MANUFACTURERS OF  


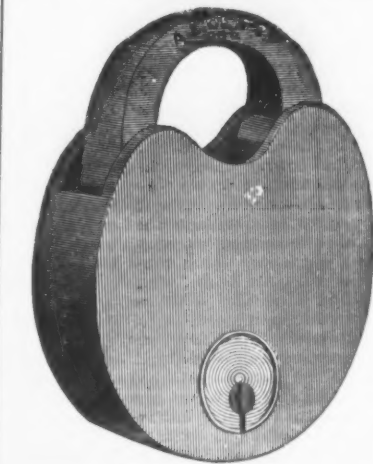
**BLACKSMITHS' DRILLS,**  
Jack Screws, Tire Benders, Track Jacks,  
Carriage Makers' Vises,  
SAD IRONS, COPYING PRESSES AND STANDS, &c

**JAY-EYE-SEE**  
NEW IMPROVED PATENT WIRE CURRY COMB.  
 

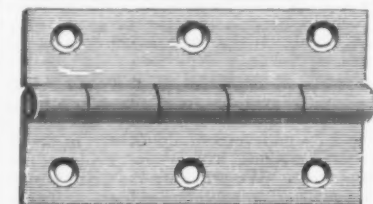
Lightest and best for general use. Most durable Comb made. Most humane and only Comb fit to use on a horse's legs, shoulders and flanks. It lifts every hair and throws out the dirt. Rins and cleans the skin, but cannot cut or scratch it. Is without a rival for clearing a mottled or sweaty animal. A wonder on a shedding horse. It cleans itself, and has an improved attachment which cleans a brush with ease and rapidity. Send for Circulars and Prices. Sample by mail, 30 cents.

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Maltby, Curtiss & Co., New York, O. S. Chamberlain,  
SOLE AGENTS FOR THE Eastern, Southern and Export Trade. 55 Dearborn St. Chicago  
Sole Agent for the West.

**A. E. DEITZ. BARBER'S BIT BRACES.**



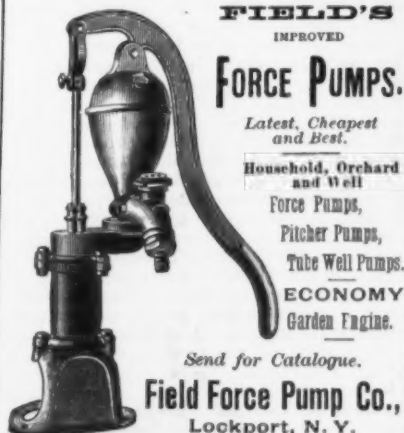
**DURRIE & McCARTY, Agents,**  
97 Chambers & 81 Reade Sts., New York.



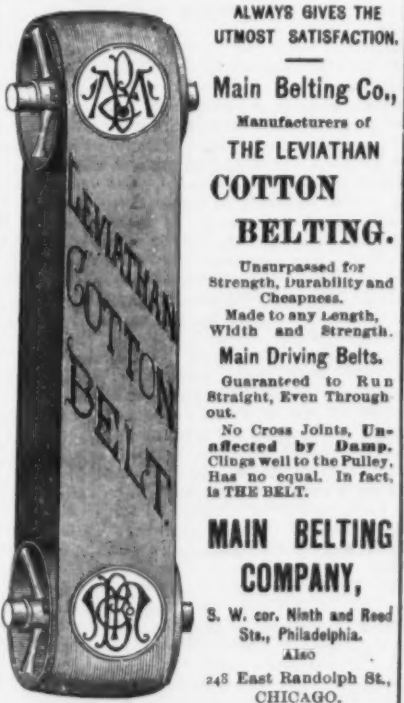
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MANUFACTURERS OF  
BRASS, GALVANIZED & SHIP CHANDLERY  
**HARDWARE.**  
Nos. 16 & 18 Chambers Street.  
NEW YORK.

**FIELD'S**  
IMPROVED  
**FORCE PUMPS.**  
Latest, Cheapest and Best.  
Household, Orchard and Well  
Force Pumps,  
Pitcher Pumps,  
Tub Well Pumps.  
ECONOMY  
Garden Engine.  
Send for Catalogue.  
**Field Force Pump Co.,**  
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ALWAYS GIVES THE  
UTMOST SATISFACTION.  
**Main Belting Co.,**  
Manufacturers of  
**THE LEVIATHAN**  
**COTTON**  
**BELTING.**  
Unsurpassed for  
Strength, Durability and  
Cheapness.  
Made to any Length,  
Width and Strength.  
Main Driving Belts.  
Guaranteed to Run  
Straight, Even Through  
out.  
No Cross Joints, Un-  
affected by Damp-  
Clings well to the Pulley.  
Is no equal. In fact,  
is THE BELT.  
**MAIN BELTING**  
**COMPANY,**  
S. W. cor. Ninth and Reed  
Sts., Philadelphia.  
Also  
248 East Randolph St.,  
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**Fine German Silver DRAWING INSTRUMENTS.**

- No. 72.—Dividers, German Silver, 3 inches long, with Pen, Pencil and Needle Points, . . . \$2.50  
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No. 78.—Spacing Dividers, all steel, with Spring and Adjusting Screw, . . . \$1.25  
No. 81.—Bow Pen, all steel, with Spring and Adjusting Screw, . . . \$1.50  
No. 84.—Bow Pencil, all steel, with Spring and Adjusting Screw, . . . \$1.50  
No. 89.—Drawing Pen, 4 to 6 inches long, German Silver, fine finish, Hinge to Pen and Protracting Pin, . . . \$0.75

These Instruments are of fine quality, and are recommended to Architects, Carpenters and Machinists for accurate drafting.  
The prices quoted do NOT include Express Charges.

Sent, postpaid, on receipt of price, by  
**DAVID WILLIAMS,**  
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Braces.

While our standard goods cannot be sold at much reduction from former prices, the new grades will be offered at market rates for goods of like quality. Our Braces are still covered by six good and valid patents, which have several years to run. Quotations on our full line will be furnished on request.

**MILLERS FALLS CO.,**

No. 74 CHAMBERS ST., NEW YORK.

**CHAMPLAIN**  
Forged Horse Nails.  
MANUFACTURED BY THE  
**NATIONAL HORSE NAIL CO.,**  
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HOT FORGED AND COLD HAMMERED POINTED - MADE OF BEST  
NORWAY IRON AND WARRANTED.  
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**THE SEIDEL & HASTINGS CO.,**  
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New York Office, No. 90 John St.; Entrance on Gold St.  
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**BEST CHARCOAL BOILER PLATES,**  
AND PLATE IRON GENERALLY.  
ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 48,508 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.

**VARIETY IRON WORKS.**  
  
**ALFRED C. REX & CO.,**  
Manufacturers of  
**PATENTED HARDWARE SPECIALTIES AND NOVELTIES.**  
MAIN OFFICE AND FACTORY: FRANKFORD, PHILA. 126 Chambers St., New York, Chas. E. Spier, Mgr. and 415 Commerce St., Phila.  
New Spring Specialties—King Egg Beaters, awarded medal at American Institute, New York; King Candle Lamp and Lantern, cheapest combination ever made.

**DAY BROS.' PORTABLE FORGES,**  
   
Fan Blowers, Tire Benders, etc.  
All sizes. The most improved and handiest.  
Blacksmiths' Machines of all sorts.  
Send for full particulars.  
419 & 421 N. 2d St., PHILADELPHIA, PA.

**PURE TURKISH EMERY.**  
**WALPOLE EMERY MILLS**  
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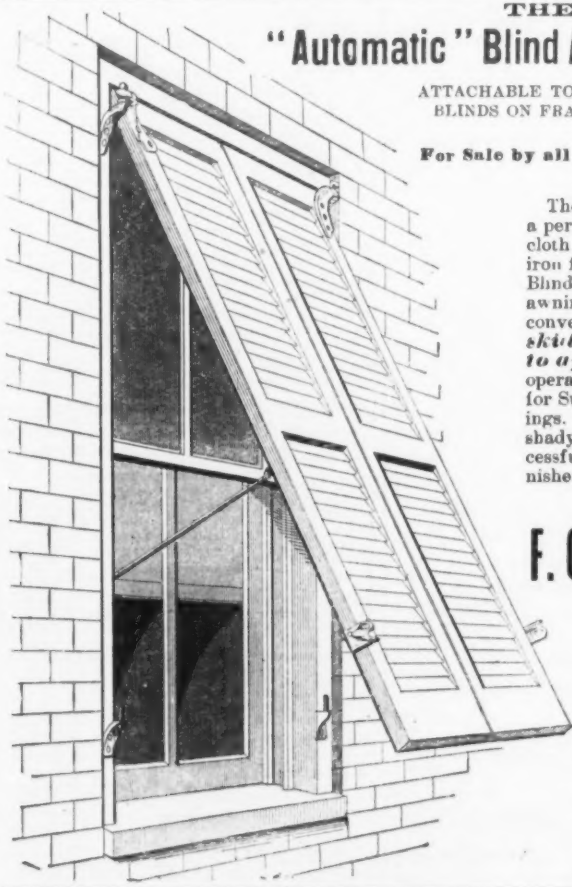




**Wrought Iron.**  
**Anti-Friction**  
**IT EXCELS ALL OTHERS**  
IN  
Security of Door.  
Strength of Material.  
Ease of Motion.  
Simplicity of Application.  
**THIS HANGER**  
Requires No Oil.  
Has No Flanged Wheels.  
Packs snugly for shipment.  
**SELLS BEST.**

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**VICTOR MFG. CO.,** Custom House Square,  
NEWBURYPORT, - MASS.



**"Automatic" Blind Awning Fixture.**

ATTACHABLE TO OLD AS WELL AS NEW  
BLINDS ON FRAME OR BRICK HOUSES.

For Sale by all the Hardware Trade.

The very best Blind Hinge and a perfect Awning Fixture. No cloth to tear and wear out. No iron frames to shake and rattle. Blinds instantly converted to awnings. Awnings instantly converted to blinds. No skilled labor necessary to apply them. A child can operate them. Indispensable for Summer Hotels and Dwellings. Rooms always cool and shady. Many thousands in successful operation. Models furnished to architects.

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**The Boss Nail Puller does not  
Infringe. All purchasers indem-  
nified.**

**Send for Discounts.**

**DIRIGO TOOL CO.,**  
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**THE BILLINGS**  
HARTFORD  
MANUFACTURERS OF  
DIES MADE IN 5  
THREADS FROM  
TO 2 INCHES V  
U.S. STANDARD AND  
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**& SPENCER CO.**  
CONN.  
SCREW PLATES AND  
SIZES CUTTING  
1/16 OF AN INCH  
THREAD. ALSO  
WHITWORTH THREAD.  
OF BAR STEEL.

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**STEPHENS & CO.,** Riverton, Conn., Manufacturers of  
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Also, Exclusive Manufacturers of L. C. STEPHENS' PATENT COMBINATION RULE.  
Send for Price List. Established in 1854.

**THE HOOSIER ROLLER SKATE.**

The Latest, Best, Most Complete and Practical Skate ever offered to the Trade.

No getting out of place of the Elastic Tension.  
Tension can be modified quicker than on any Skate  
made. Made of the best material, and every pair  
thoroughly tested. Not liable to constant repair.  
Please send for prices and terms to

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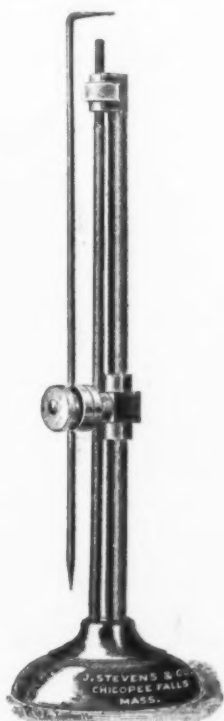
Liberal Terms to the Trade.



**Stevens's New Surface Gauge.**

Messrs. J. Stevens & Co., of Chicopee Falls, Mass., are now bringing out a new surface gauge, shown in the annexed illustrations, and claimed to be superior to all others in its quick and fine adjusting powers, and especially in the grasp of its pointer. This tightens on to one of the rods, and moves only with it, instead of sliding upon it, as others do, and is held perfectly firm in all its adjustments. The post A is rigidly fastened to the base B in the usual manner. At the top of the post is the nut-guide m for nut O. The adjusting-rod c is guided at the top in a hole through m, and at the bottom in a hole in the base B. By means of the nut O the rod and attached parts can be adjusted vertically. The support d is made with a branch, k, through which the rod c passes. This branch is recessed to receive the cylindrical head w of clamp-screw i. The rod c passes through the head w and branch k. The pointer n is held between two clamps, e, e, as clearly represented. This permits of turning the pointer and clamps on the screw i, and of binding the whole by means of nut f. It will be understood that the mechanism carrying the pointer can, when the nut f is loosened, be readily moved up or down the post; that when the nut f is tightened it clamps this mechanism to the rod c, but by turning nut O the pointer can be adjusted a short distance up or down to bring it to the exact position required, after it is otherwise securely clamped. The advantages of providing for this adjustment will be apparent to those accustomed to use such tools.

By having a hole drilled in the base it is also adapted to a depth gauge and various other purposes. In the small size the base is of cast iron, round, and turned true with



purchase money. The property consists of seven tracts of valuable iron-ore and timber land comprising 10,000 acres, besides the forge and furnace, and is valued at \$300,000. Owing to the disagreement of the parties in regard to the disposing of the property the sale was postponed until Friday, April 17, when the court will decide whether it shall be sold in its entirety or in parts.

An order was issued some days ago requesting the miners at the Redstone Coke Works, in the Connelville region, to use safety lamps. The men objected because the lamps did not give good light, and about 40 of them quit rather than use them.

It is reported that the Sharon Iron Company are about to blow out the one of their two blast furnaces which is at present in operation.

Fairchance Furnace, in Fayette County, was blown in on Monday, April 6.

It is reported that Etna Furnace, of the Etna Iron Works, Newcastle, in which P. L. Kimberly, of Sharon, is the largest stockholder, is being prepared for blast. The furnace has been idle for some months past.

James P. Witherow, of Pittsburgh, is erecting new hot-blast stoves at Dunbar Furnace, Fayette County.

Pierce, Kelly & Co., of Sharpsville, have blown in their Sharpsville Furnace, which had been idle for some time. They employ over 100 men.

Executions have been issued against the Rogers Stove Company, of Downingtown, and the sheriff has levied upon the property and closed the works. Insufficient capital is reported to be the cause of the trouble.

The E. & G. Brooke Iron Company, of Birdsboro, will do no work in their rolling mill and nail factory this week, to make necessary repairs.

The copartnership existing between Le Grand Skinner and Thos. C. Wood, under the firm name of Skinner & Wood, has been dissolved. Mr. Le G. Skinner will continue

coming in daily. This firm are also making three cast-steel rolls for the Phoenix Iron Works, Phoenixville, Pa., which weigh over 4 tons apiece. They are now very busy in all departments of their works.

OHIO.

The Calumet Fire Clay Company, Ellitsville, will start up full this week. About three months ago they were burned out, but since then have been energetically pushing the construction of new buildings. The new establishment is built of wood and bricks and will be made as nearly fire-proof as possible by a covering of sheet zinc. Jones & Laughlins, of Pittsburgh, furnished the pulleys and shafting, and the Chalmers-Spence Company the pipe coverings. The capital stock of the company has been increased to \$80,000.

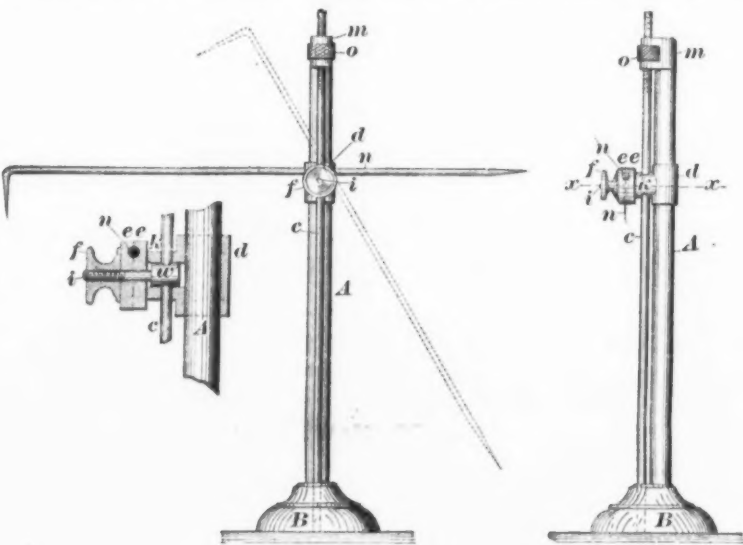
The Belfont Iron Works Company, of Ironton, have abandoned their gas well at the depth of 202 1/2 feet. There is some talk of raising money among the citizens, taking the well and boring 500 feet deeper.

The firm of Rhodes & Co., of Cleveland, dealing in coal, iron ore and pig iron, was dissolved by mutual consent on April 1, and the business will be continued by M. A. Hanna & Co. Messrs. R. R. Rhodes and J. F. Rhodes retire, the new firm consisting of Messrs. Marcus A. Hanna, Leonard C. Hanna and Arnold C. Saunders.

The nut works of Arms, Bell & Co., Youngstown, started up April 6.

A strike was begun on April 1 at the Riverside Glass Works, at Wellsburg. The difficulty grew out of the employment of a gathering boy who was objectionable to the Glass Workers' Union, and whom the manager refused to discharge at the demand of the lodge.

Judge Pearce, of Steubenville, has just delivered a decision as to the Irondale Furnace property in Jefferson County, the question being as to the amount of compensation due J. N. McIntosh for taking care of the property. When the property was first sold it was bought by Henry M. Long, trustee, who promised McIntosh \$25 per month to



STEVENS'S NEW SURFACE GAUGE.

the upright spindle. The total height is 8 inches, and will scratch 8 inches sideways and 13 inches high. The cast-steel needle is pointed on each end, one of which ends is bent to a right angle. All parts are polished and accurately fitted. The large-size tool weighs 2 pounds, and its arm will scratch 10 1/2 inches sideways and 18 inches high. These points, together with its simplicity, as shown by the cut, make it a most desirable tool for practical mechanics.

**INDUSTRIAL ITEMS.**

**PENNSYLVANIA.**

Arrangements are being made to blow in one of the Lehigh Iron Company's furnaces at Aineyville, and one of the Copley Iron Company's stacks at Copley. The latter furnaces have been idle for over two years.

The Thomas Iron Company are preparing one of the recently purchased Saucon Furnaces for blast.

The work of relining Charlotte Furnace, at Scottsdale, Westmoreland County, will be completed at an early date, and the furnace will probably be blown in.

The Middlesex Rolling Mill, at West Middlesex, owned by the Wheeler Iron Company, of Sharon, was to have resumed operations on April 7.

Sternbergh's Rolling Mill, in Reading, which had been closed for a week for repairs to the engines, commenced operations on April 6. The mill gives employment to about 50 men.

The coke works in the Connelville region were idle two days last week.

The assignee of Dr. S. C. Baker, Martin Bell, Jr., will offer at public sale at Allegheny Furnace, near Altoona, Blair County, on Wednesday, April 15, 1885, at 10 o'clock a. m., 1000 tons pig iron pledged to various parties in Pittsburgh, and to be sold subject to the rights of the parties to whom it is pledged, 142 tons pig iron, 30 tons cast scrap, 15 tons wrought scrap, 500 tons hematite, 300 tons soft fossil and 350 tons hard fossil ore, 16 railroad cars, 50 small ore cars, 10 mules and various other personal property.

The 5-ton hammer at Charming Forge, at Womelsdorf, Berks County, broke on April 9, causing a stoppage of the entire works. The loss is \$300. The Messrs. Taylor expect to replace the hammer shortly and continue the business.

Barree Furnace and Forge, owned by J. W. Mumper & Co., situated in Barree Township, Huntingdon County, on April 10 was offered again at sheriff's sale, the former sale having been annulled by the court, owing to the delayed payment of the

the business, under the name of the Skinner Engine Company.

P. L. Kimberly & Co., of Sharon, started their Greenville Rolling Mill on April 10 double turn.

M. V. Smith, of Tyrone, is erecting two of his improved 30-ton gas furnaces for the Ellis & Lessig Steel and Iron Company, of Pottstown.

**PITTSBURGH AND VICINITY.**

It is reported that McKeesport and Bradock are offering inducements to Chess, Cook & Co. to remove their nail mill and factory from their present location on the Southside.

D. W. C. Carroll & Co. have launched two of the steel barges built for Captain Eads for use in the Mississippi River improvement, and the two remaining are being moved to the river. The firm are engaged on general ironwork, having no special orders on hand at present.

At the Pittsburgh Locomotive Works only a small part of the usual force is at work. They are employed on boiler and finishing work, as the firm have no special orders.

Shoenberger & Co. are making preparations to build a Bessemer steel plant, the product to be used in the manufacture of nails. The plant will be in running order as soon as possible.

Of the six Westinghouse gas wells that were sunk in the Homewood district only Nos. 5 and 6 are furnishing any gas, and they only sufficient to furnish the few domestic consumers. It is stated that the Westinghouse people have not gone deep enough to strike the true vein of gas, which dips this side of the Tarentum region at the rate of 40 feet to a mile.

The gas well which has been struck by the Canonsburg Iron Company near their works is reported to be nearly as large as the McGuinn well.

Hubbard, Bakewell & Co. are moving their axe, shovel, saw, hoe and drain tool manufacturing establishment from their old stand on Dinwiddie and Colwell streets to the corner of Forty-eighth street and the Allegheny Valley Railroad. The new quarters of the firm will be much larger and better adapted for their work.

The Novelty Tool Company, Limited, have nearly completed their new works at Verona, and expect to get them into operation about the middle of the present month. The company have many orders on hand for wrenches, combination tools, &c.

The Pittsburgh Steel Casting Company are now making over 300 cast-steel car axles per day. This axle has admirably withstood all tests required of it, and large orders are

care for the property. Long then mortgaged the property to Pittsburgh creditors for \$25,000, and it was afterward taken by the mortgagees at a less price than their mortgage. The mortgagees claimed McIntosh should look to the surplus, and not to them, for his money. The Judge decided the foreclosure of the mortgage terminated Long's trusteeship, and ordered that McIntosh should be paid from the proceeds of the sale the sum of \$300 and costs of his application. Only one of the original owners of the works, McNab, has recovered more than he invested.

**MISSOURI.**

The Shickle, Harrison & Howard Iron Company, of St. Louis, are building an additional drying oven in their new foundry for pipe.

Rohan Bros., of St. Louis, boiler manufacturers, in addition to a large amount of repair work, are engaged upon a large job for the Las Vegas (New Mexico) Wood Preserving Company, consisting of two cylinders 110 feet long, 6 feet in diameter, out of 1/2-inch iron, to be used for creosoting wood—a process designed for the preservation of wood employed in bridge building, &c.—and also two large boilers. They also have a contract for refitting the Mississippi Valley Transportation Company's line of tow-boats—putting in entire new sets of breeching, stocks, &c.

The Western Forge and Tool Works, of St. Louis, have recently occupied their handsome new building, 40 x 101 feet, at the corner of Collins and Ashley streets. A full force of men is employed on full time.

The Laclede Fire Brick Mfg. Co., of St. Louis, are putting up a new three-story brick building which will be used as an additional factory for sewer-pipe.

One hundred and fifty men employed in the Miscuri Car and Foundry Company's shops, at St. Louis, struck April 12. The cause which led to this action was a reduction of 10 per cent. in their wages. The shops are closed, and the proprietors refuse to entertain propositions from strikers.

**ILLINOIS.**

The Chicago Safe and Lock Company are at work on an order from San Francisco, Cal., for six safes. The machinery for the work is all in, and the works are being operated to their full capacity.

Kiely & Vo-s, of Chicago, are building an addition to their wire works, 26 x 53 feet in extent, of brick, and two stories and basement high.

**ALABAMA.**

There is no truth in the statement that the Woodward Iron Company are about to build a rolling mill near their blast furnace at Wheeling.



# Current Hardware Prices, April 15, 1886.

## HARDWARE.

<b>Anvils.</b>	
Each Anvil American.....	\$ 1.00 - \$1.20
Wright's.....	1.00 - 1.10
Armstrong's.....	1.00 - 1.10
Armstrong's Mouse Hole, Extra.....	1.15
Wright's.....	1.00 - 1.10
Wright's.....	1.00 - 1.10
<b>Anvil Vise and Drill.</b>	
Miller's Vise, \$15.00.....	15.00
Cheney Anvil and Vise.....	25.00
<b>Augers and Bits.</b>	
First Quality.....	10.00
Second Quality.....	8.00
Third Quality.....	6.00
Fourth Quality.....	4.00
Augers, Double Flute.....	10.00
Augers, Single Flute.....	8.00
Augers, Triple Flute.....	12.00
Augers, Four Flute.....	15.00
Augers, Five Flute.....	18.00
Augers, Six Flute.....	20.00
Augers, Seven Flute.....	22.00
Augers, Eight Flute.....	24.00
Augers, Nine Flute.....	26.00
Augers, Ten Flute.....	28.00
Augers, Eleven Flute.....	30.00
Augers, Twelve Flute.....	32.00
Augers, Thirteen Flute.....	34.00
Augers, Fourteen Flute.....	36.00
Augers, Fifteen Flute.....	38.00
Augers, Sixteen Flute.....	40.00
Augers, Seventeen Flute.....	42.00
Augers, Eighteen Flute.....	44.00
Augers, Nineteen Flute.....	46.00
Augers, Twenty Flute.....	48.00
Augers, Twenty One Flute.....	50.00
Augers, Twenty Two Flute.....	52.00
Augers, Twenty Three Flute.....	54.00
Augers, Twenty Four Flute.....	56.00
Augers, Twenty Five Flute.....	58.00
Augers, Twenty Six Flute.....	60.00
Augers, Twenty Seven Flute.....	62.00
Augers, Twenty Eight Flute.....	64.00
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Augers, Thirty One Flute.....	70.00
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Augers, Three Hundred Eleven Flute.....	630.00
Augers, Three Hundred Twelve Flute.....	632.00
Augers, Three Hundred Thirteen Flute.....	634.00
Augers, Three Hundred Fourteen Flute.....	636.00
Augers, Three Hundred Fifteen Flute.....	638.00
Augers, Three Hundred Sixteen Flute.....	640.00
Augers, Three Hundred Seventeen Flute.....	642.00
Augers, Three Hundred Eighteen Flute.....	644.00
Augers, Three Hundred Nineteen Flute.....	646.00
Augers, Three Hundred Twenty Flute.....	648.00
Augers, Three Hundred Twenty One Flute.....	650.00
Augers, Three Hundred Twenty Two Flute.....	652.00
Augers, Three Hundred Twenty Three Flute.....	654.00
Augers, Three Hundred Twenty Four Flute.....	656.00
Augers, Three Hundred Twenty Five Flute.....	658.00
Augers, Three Hundred Twenty Six Flute.....	660.00
Augers, Three Hundred Twenty Seven Flute.....	662.00
Augers, Three Hundred Twenty Eight Flute.....	664.00
Augers, Three Hundred Twenty Nine Flute.....	666.00
Augers, Three Hundred Thirty Flute.....	668.00
Augers, Three Hundred Thirty One Flute.....	670.00
Augers, Three Hundred Thirty Two Flute.....	672.00
Augers, Three Hundred Thirty Three Flute.....	674.00
Augers, Three Hundred Thirty Four Flute.....	676.00
Augers, Three Hundred Thirty Five Flute.....	678.00
Augers, Three Hundred Thirty Six Flute.....	680.00
Augers, Three Hundred Thirty Seven Flute.....	682.00
Augers, Three Hundred Thirty Eight Flute.....	684.00
Augers, Three Hundred Thirty Nine Flute.....	686.00
Augers, Three Hundred Forty Flute.....	688.00
Augers, Three Hundred Forty One Flute.....	690.00
Augers, Three Hundred Forty Two Flute.....	692.00
Augers, Three Hundred Forty Three Flute.....	694.00
Augers, Three Hundred Forty Four Flute.....	696.00
Augers, Three Hundred Forty Five Flute.....	698.00
Augers, Three Hundred Forty Six Flute.....	700.00
Augers, Three Hundred Forty Seven Flute.....	702.00
Augers, Three Hundred Forty Eight Flute.....	704.00
Augers, Three Hundred Forty Nine Flute.....	706.00
Augers, Three Hundred Fifty Flute.....	708.00
Augers, Three Hundred Fifty One Flute.....	710.00
Augers, Three Hundred Fifty Two Flute.....	712.00
Augers, Three Hundred Fifty Three Flute.....	714.00
Augers, Three Hundred Fifty Four Flute.....	716.00
Augers, Three Hundred Fifty Five Flute.....	718.00
Augers, Three Hundred Fifty Six Flute.....	720.00
Augers, Three Hundred Fifty Seven Flute.....	722.00
Augers, Three Hundred Fifty Eight Flute.....	724.00
Augers, Three Hundred Fifty Nine Flute.....	726.00
Augers, Three Hundred Sixty Flute.....	728.00
Augers, Three Hundred Sixty One Flute.....	730.00
Augers, Three Hundred Sixty Two Flute.....	732.00
Augers, Three Hundred Sixty Three Flute.....	734.00
Augers, Three Hundred Sixty Four Flute.....	736.00
Augers, Three Hundred Sixty Five Flute.....	738.00
Augers, Three Hundred Sixty Six Flute.....	740.00
Augers, Three Hundred Sixty Seven Flute.....	742.00
Augers, Three Hundred Sixty Eight Flute.....	744.00
Augers, Three Hundred Sixty Nine Flute.....	746.00
Augers, Three Hundred Seventy Flute.....	748.00
Augers, Three Hundred Seventy One Flute.....	750.00
Augers, Three Hundred Seventy Two Flute.....	752.



**Parallel, Simpson's Adjustable.**.....ds 40 c  
Saw Filers, Bonney's, Nos. 2 & 3.....ds \$15.00, ds 40 c  
Saw Filers, Stearns'.....ds 35 c  
Saw Filers, Hopkins'.....ds 17 c  
Saw Filers, Reading'.....ds 10x1 c  
Saw Filers, Wentworth'.....ds 20x10 c  
Cowell Hand Vise.....ds 30 c  
Richardson's Vise and Anvil.....ds 32 c

**Washer Cutters.**  
Smith's Patent.....P doz \$12.00, ds 30x10x10 c  
Johnson's.....P doz \$11.00, ds 35x5 c  
Penry's.....P doz Pol. \$11; Jap'd. \$16, ds 55 c  
Appleton's.....P doz \$16.90, ds 60x10 c  
Bonney's.....ds 30x10 c

**Washers.**—See Nuts and Washers.  
**Well Wheels.**—8 in., \$1.85; 10 in., \$2.15; 12 in., \$2.80

**Wire.**  
Brass and Copper, new list Jan. 18, '84 ds 30x30x5 c  
Market, Bright and Annealed, Nos. 0 to 18.....ds 70x5 c  
Market, Corrupted.....ds 65x5 c  
Market, Galvanized.....ds 60x5 c  
Stone, Tinned, Tinned list.....ds 70x5 c  
Stone, Bright and Annealed Nos. 10 to 30.....ds 70x5 c  
Stone, Bright and Annealed Nos. 27 to 30.....ds 75x5 c  
Stone, Galvanized, Nos. 10 to 30.....ds 55x5 c  
Stone, Tinned, Tinned list.....ds 60x5 c  
Tinned Droom Wire.....ds 65x5 c  
Cast Steel Wire.....ds 55x5 c  
Annealed Fence, Nos. 8 & 9.....ds 35x5 c  
Annealed Grape, Nos. 10 to 14.....ds 70x5 c  
Fence Stauden.....P lb 34c or 35c  
Fence Staples, Galvanized.....\$6.00 to \$2, ds 30 c  
Stubs' Steel Wire.....ds 60x10 to \$2, ds 30 c  
Barb Fence.....See Trade Report  
Barb Wire Safety Guards.....\$1000 \$3.00, ds 25 c  
Wire on Spools.....ds 65 c  
Steel Music Wire, Nos. 7 to 30.....ds 55 c  
Pictur' Wire.....ds 60x10 c  
Wire Clothes Line, See Lines  
Wire Cloth, green, drab and black, P 100 sq. ft.  
.....\$2.00 net or ds 5 or 10x

**Wrenches.**—American Adjustable.....ds 45 c  
Baxter's Adjustable "S".....ds 35x5 c  
Baxter's Diagonal.....ds 35x10 c  
Coe's Machine.....cash in 10 days, ds 60x5 c  
Coe's "Mechanic".....ds 60x10 c  
Coe's Pattern, Malleable.....ds 80x5 x10x5 c  
Fence Standard.....ds 70 c  
Girard Standard.....ds 75x10 or 75x10x5 c  
Girard Agricultural.....ds 75x10 c  
Remis & Call's Patent Combination.....ds 70x5 c  
Remis & Call's Merrick's Pattern.....ds 35 c  
Remis & Call's Bridge's Pattern.....ds 25 c  
Remis & Call's Cylinder or Gas Pipe.....ds 40x5 c  
Remis & Call's No. 3 Pipe.....\$6.00, ds 50x10 c  
Aiken's Pocket (Bright).....P doz \$4.00, ds 40 c  
The Favorite Pocket (Bright).....P doz \$4.00, ds 40 c  
Welster's Patent Combination.....ds 25 c  
Boardman's.....ds 25x5 c  
Always Ready.....ds 25x5 c  
Aluminum.....ds 40x10 c  
Donohue's Engineer.....ds 25 c

**Wringers.**.....Per doz.  
Novelty, for Common Tubs, No. 2, 10 inch.....\$30.00  
Novelty, for Common Tubs, No. 3, 11 inch.....34.50  
Excelsior, for Common Tubs, No. E, 10 inch.....35.00  
Excelsior, for Stationary Tubs, No. F, 11 inch.....43.50  
Excelsior, with Folding Bench, No. A, 10 inch.....48.00  
Universal, No. 2.....30.00  
Universal, No. 14.....35.00  
Universal, No. 15.....30.00  
Universal, No. 1.....57.00  
Universal, for Set Tubs, A.....45.00  
Universal, for Set Tubs, C.....48.00  
Westler's Patent Combi., No. R, 11 inch.....60.00  
Adams & Co., No. 8.....30.00  
Peerless No. 26.....34.00  
No. 10 Improved.....30.00  
"Metropolitan," No. 2.....30.00  
"Metropolitan," No. 26.....50.00  
Leader.....28.00  
Advance.....27

**Wrought Staples, Hooks, &c.**—See Hooks.

**S. H. & E. Y. MOORE,**  
163 & 165 Lake St., Chicago,  
**HEAVY HARDWARE**  
AND  
**Railroad Supplies.**  
MANUFACTURERS OF  
"CLIMAX" BARN DOOR HANGERS,  
"ZENITH" BARN DOOR HANGERS,  
For Wood Track,  
MOORE'S FREIGHT CAR DOOR HANGERS  
BAGGAGE CAR DOOR HANGERS,  
RAILROAD HANGERS,  
PARLOR DOOR HANGERS.  
Send for New Price Lists.  
EASTERN AGENTS:  
**H. B. NEWHALL CO.**  
105 Chambers St., New York. 47 Pearl St., Boston.  
**ARMSTRONG'S**  
Improved Water Box and Steam-Fitters'  
**TOOLS.**  
  
**Adjustable Stock and Dies for Pipes, Bolts and Brass Tubing.**  
Tapped to standard gauges. Adjustable to all variations in the size of fittings. Can be rebar and set without drawing the temper, by simply grinding. Possessing practical advantages appreciated by all mechanics. Circulars sent free on application.  
Manufactured by **F. ARMSTRONG,** Bridgeport, Conn.

**Engineering Materials.**  
Incorporated 1881. THE Largest Manufacturers IN THE WORLD OF  
Nickel Anodes,  
Nickel Salts,  
Patent Muslin Buffs,  
Polishing Lathes,  
Polishing Felt,  
Polishing Rouges,  
Pol'ng Compositions,  
Walrus Leather,  
Wood Emery Wheels  
Platers' Brushes,  
&c., &c., &c.

OFFICES:  
to 40 11th Ave. NEW YORK U.S.A.



# WHOLESALE METAL PRICES, April 15, 1885.

## METALS.

**IRON.**—Duty: Bars, 8-10¢ to 11-10¢; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢. Band, Hoop and Scroll, 1¢ to 4-10¢. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 14¢.

### Standard American Pig Iron.

Foundry No. 1 X... 10.00 @ 19.00  
Foundry No. 2 X... 10.00 @ 18.00  
Gray Forge... 10.00 @ 17.00

### No. 1 Scotch Pig Iron.

Carnegie... 10.00 @ 19.50  
Coltess... 10.00 @ 21.50  
Shotts... 10.00 @ 22.00  
Glenbrook... 10.00 @ 21.50  
Langdon... 10.00 @ 21.50  
Sumner... 10.00 @ 21.00  
Dalmenington... 10.00 @ 19.25  
Erlinton... 10.00 @ 18.50  
Clyde... 10.00 @ 19.00

### Rails.

Steel at Eastern mills... 10.00 @ 27.00  
Old Rails, Ts... 10.00 @ 17.00

### Scrap.

Wrought, 100 lb. from yard... 18.50 @ 19.00

### Bar Iron from Store.

Common Iron: 1 to 1 in. round and square... 1.50 @ 1.90

Refined Iron: 1 to 1 in. round and square... 1.85 @ 2.20

1 to 1 in. x 1/2 and 3/4... 1.90 @ 2.40

Rods—1/2 and 1-1/2 round and sq... 1.90 @ 2.40

Bands—1 to 6-1/2 to No. 12... 2.20 @ 2.50

Burden's Best "Iron, base price... 2.20 @ 2.50

Burden's "H. B. & S." Iron, base price... 2.20 @ 2.50

Korway Nail Rods... 2.20 @ 2.50

### Sheet Iron from Store.

Common... 10.00 @ 19.00  
American... 10.00 @ 18.00

Nos. 10 to 16... 10.00 @ 19.00

17 to 20... 10.00 @ 18.00

21 to 24... 10.00 @ 17.00

25 and 26... 10.00 @ 16.00

27... 10.00 @ 15.00

28... 10.00 @ 14.00

Galvanized, 10 to 20... 10.00 @ 19.00

Galvanized, 21 to 24... 10.00 @ 18.00

Galvanized, 25 to 26... 10.00 @ 17.00

Galvanized, 27... 10.00 @ 16.00

Galvanized, 28... 10.00 @ 15.00

American Russia... 10.00 @ 14.00

Russian... 10.00 @ 13.00

American Cold Rolled B. B... 10.00 @ 12.00

### Iron Wire. See Wire.

**STEEL.**—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ per lb., 2¢ ad. val.; valued above 7¢ and not above 10¢ per lb., 3¢ ad. val.; valued above 10¢ per lb., 4¢ ad. val. Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1 1/2¢ ad. val. in addition to above; Steel Circular Saw Plates, 1¢ ad. val. in addition to the above.

### American Cast Steel.

For American Steel, see Pittsburgh quotations.

### English Steel.

Best Cast... 10.00 @ 19.00

Extra Cast... 10.00 @ 18.00

Circular Saw Plates... 10.00 @ 17.00

Round Machinery, Cast... 10.00 @ 16.00

Swaged, Cast... 10.00 @ 15.00

Best Double Shear... 10.00 @ 14.00

Blister, 1st quality... 10.00 @ 13.00

German Steel, Best... 10.00 @ 12.00

2d quality... 10.00 @ 11.00

Sheet Cast Steel, 1st quality... 10.00 @ 10.00

2d quality... 10.00 @ 9.00

3d quality... 10.00 @ 8.00

**TIN.**—Duty: Plates, Sheets, Tagger and Terne, 1¢ per lb.; Bars, Block and Pigs free.

Banca... 10.00 @ 19.00

Straita... 10.00 @ 18.00

English... 10.00 @ 17.00

Bar... 10.00 @ 16.00

### Charcoal Tin Plates.

10x14 25 sheets... 10.00 @ 19.00

10x12 25 sheets... 10.00 @ 18.00

10x10 25 sheets... 10.00 @ 17.00

10x8 25 sheets... 10.00 @ 16.00

10x6 25 sheets... 10.00 @ 15.00

10x4 25 sheets... 10.00 @ 14.00

10x2 25 sheets... 10.00 @ 13.00

For each additional X add... 1.25 @ 2.00

### Coke Tin Plates.

Best... 10.00 @ 19.00

Ordinary... 10.00 @ 18.00

10x14... 10.00 @ 17.00

10x12... 10.00 @ 16.00

10x10... 10.00 @ 15.00

10x8... 10.00 @ 14.00

10x6... 10.00 @ 13.00

10x4... 10.00 @ 12.00

10x2... 10.00 @ 11.00

### Tin Plates.

Prime Char. 3d quality... 10.00 @ 19.00

Coke... 10.00 @ 18.00

10x14... 10.00 @ 17.00

10x12... 10.00 @ 16.00

10x10... 10.00 @ 15.00

10x8... 10.00 @ 14.00

10x6... 10.00 @ 13.00

10x4... 10.00 @ 12.00

10x2... 10.00 @ 11.00

### Tin Boiler Plates.

10x14 25 sheets for No. 7, 112 sheets... 10.00 @ 19.00

10x12 25 sheets... 10.00 @ 18.00

10x10 25 sheets... 10.00 @ 17.00

10x8 25 sheets... 10.00 @ 16.00

10x6 25 sheets... 10.00 @ 15.00

10x4 25 sheets... 10.00 @ 14.00

10x2 25 sheets... 10.00 @ 13.00

### COPPER.

Duty: 1¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad. valorem.

Ingot, Lake... 10.00 @ 19.00

Ingot, Baltimore... 10.00 @ 18.00

Ingot Anchor... 10.00 @ 17.00

Braziers' Copper, ordinary sizes... 10.00 @ 16.00

16 oz. 1/2 lb. and over... 10.00 @ 15.00

Braziers' Copper, ordinary sizes... 10.00 @ 14.00

under 16 oz. and over 12 oz... 10.00 @ 13.00

sq. ft... 10.00 @ 12.00

Braziers' Copper, 10 oz. and 12 oz. sq. ft... 10.00 @ 11.00

Lighter than 10 oz. sq. ft... 10.00 @ 10.00

Circles less than 8 in. in diam... 10.00 @ 9.00

8 1/2 in. diam. and over... 10.00 @ 8.00

Segment and Pattern Sheets... 10.00 @ 7.00

Locomotive Fire-Box Sheets... 10.00 @ 6.00

Sheathing Copper, over 12 oz. sq. ft... 10.00 @ 5.00

sq. ft... 10.00 @ 4.00

Bolt Copper... 10.00 @ 3.00

Copper Bottoms... 10.00 @ 2.00

Nickel-Plated Sheathing... 10.00 @ 1.00

### Tinning.

14x8, by the case... 10.00 @ 19.00

4x8, less than case... 10.00 @ 18.00

For tinning both sides, double the above amount.

**O'Neill's Patent Plated Copper.**—Net.

14x8... 10.00 @ 19.00

14 and 16 oz. and heavier... 10.00 @ 18.00

18 oz. and lighter... 10.00 @ 17.00

Boiler Sizes... 10.00 @ 16.00

14 and 16 oz. and heavier... 10.00 @ 15.00

(And all sizes not over 20 in. wide.)... 10.00 @ 14.00

14x8 and 14x6... 10.00 @ 13.00

14 and 16 oz. and heavier... 10.00 @ 12.00

12 oz... 10.00 @ 11.00

### Copper Wire.

(See Wire.)

**Sheathing Metal.**

Yellow Sheathing Metal... 10.00 @ 19.00

**BRASS AND GERMAN SILVER.**

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884... 10.00 @ 19.00

dis. 20 @ 30¢

**LEAD.**—Duty: 1¢ per lb. 100 lb; Old Lead, 2¢ per lb.

100 lb; Old Lead, 2¢ per lb.

dis. 20 @ 30¢

American... 10.00 @ 19.00

dis. 20 @ 30¢

Pipe... 10.00 @ 18.00

dis. 20 @ 30¢

Pipe... 10.00 @ 17.00

dis. 20 @ 30¢

Pipe... 10.00 @ 16.00

dis. 20 @ 30¢

Pipe... 10.00 @ 15.00

dis. 20 @ 30¢

Pipe... 10.00 @ 14.00

dis. 20 @ 30¢

Pipe... 10.00 @ 13.00

dis. 20 @ 30¢

Pipe... 10.00 @ 12.00

dis. 20 @ 30¢

Pipe... 10.00 @ 11.00

dis. 20 @ 30¢

Pipe... 10.00 @ 10.00

dis. 20 @ 30¢

Pipe... 10.00 @ 9.00

dis. 20 @ 30¢

Pipe... 10.00 @ 8.00

dis. 20 @ 30¢

Pipe... 10.00 @ 7.00

dis. 20 @ 30¢

Pipe... 10.00 @ 6.00

dis. 20 @ 30¢

Pipe... 10.00 @ 5.00

dis. 20 @ 30¢

Pipe... 10.00 @ 4.00

dis. 20 @ 30¢

Pipe... 10.00 @ 3.00

dis. 20 @ 30¢

Pipe... 10.00 @ 2.00

dis. 20 @ 30¢

Pipe... 10.00 @ 1.00

dis. 20 @ 30¢

Pipe... 10.00 @ 0.00

dis. 20 @ 30¢

Pipe... 10.00 @ 0.00

dis. 20 @ 30¢

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dis. 20 @ 30¢

Pipe... 10.00 @ 0.00

dis. 20 @ 30¢

Pipe... 10.00 @ 0.00

dis. 20 @ 30¢



## HARDWARE NOVELTIES.

## Double-Clasp Blind-Slat Holder.

Fig. 1 shows, full size, a Blind-Slat Holder which John W. Harmon, of 65 Haverhill street, Boston, Mass., is now putting upon

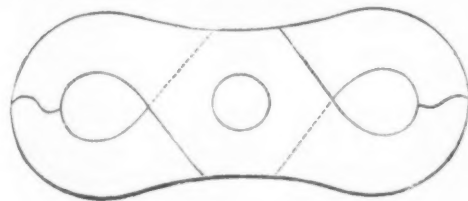


Fig. 1.—Double Clasp Blind-Slat Holder.

the market. This clasp consists of two pieces of sheet metal, preferably brass, united at the center, and moving about the pivot thus provided. The parts are made slightly concave, so as to afford the necessary spring for taking up the end motion of the blind slat. Fig. 3 shows the method of applying the

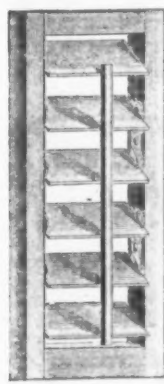


Fig. 2.

Elevation and Section, Showing Application of Blind-Slat Holder.

device. It is opened as shown at A, and passed between two slats, after which it is closed as shown at B. In closing, the ends encircle the pivots of two slats, as shown, and form a wedge between the slat and the stile of the blind. Fig. 2 shows the appearance of the blind with the holder in use. The special advantage to which the maker directs attention is that no tools are required for putting this device in place. It is self-contained and said to be very effective.

## The Ohio Anti-Friction Door-Hanger.

Fig. 1 of the engravings shows a Door-Hanger with double adjustment made by the Whipple Mfg. Co., Cleveland, Ohio, and known in the trade as the "Ohio" hanger. This device is the production of a builder of

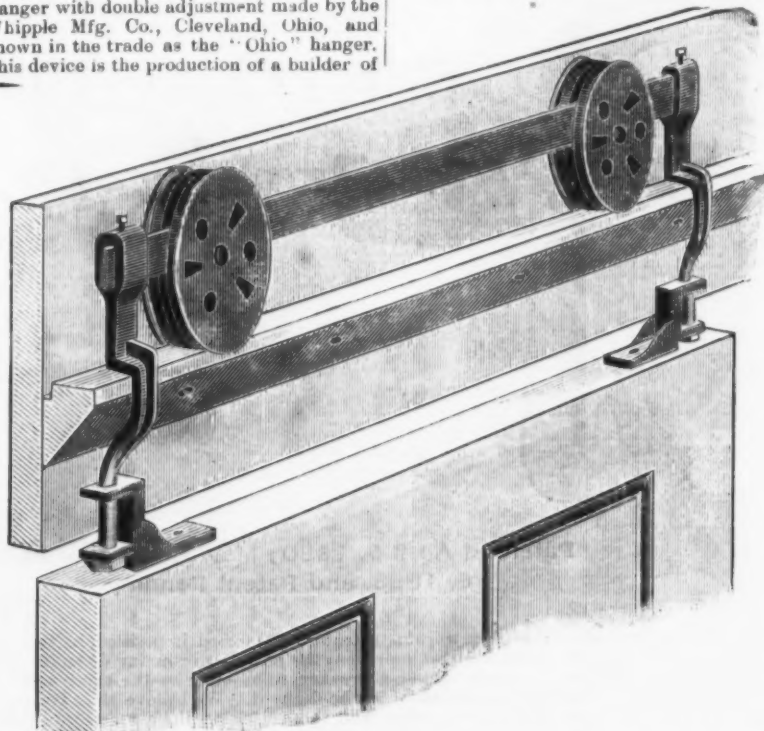


Fig. 1.—The Ohio Anti-Friction Sliding Door-Hanger.—Whipple Mfg. Co., Cleveland, Ohio.

many years' experience, and is the result of an effort made to combine the excellencies of many different hangers in the market, and, to produce something that would be

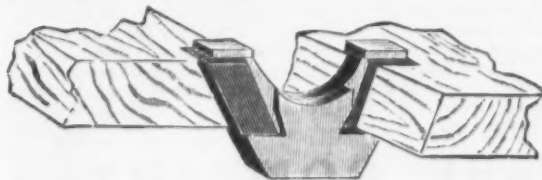


Fig. 2.—Anti-Friction Floor Guide Used with the Ohio Hanger.

better adapted to the actual wants of builders than anything heretofore introduced. It will be noticed that the hanger is very simple in its parts, and that an adjustment

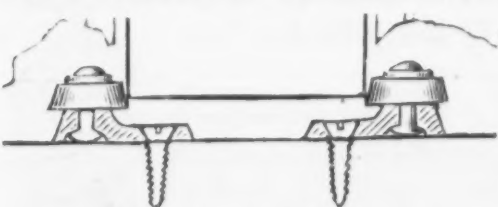


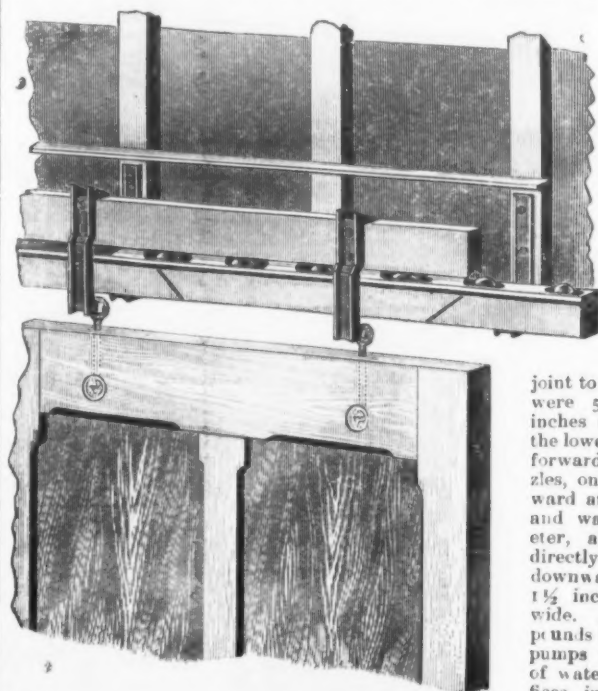
Fig. 3.—Center Stop Used with the Ohio Hanger.

in any direction desired is provided. No mortising of the doors is necessary, the brackets to which the hangers are connected being fastened to the top of the door. The wheels are slightly flanged and work on a hardwood track. Fig. 2 shows the anti-

friction floor guide used with this hanger, and Fig. 3 the center stop. The latter is let into the head jamb, insuring against pulling off of the jamb and marring the side of the door. It is packed with rubber, and accordingly is noiseless. It is put in place without screws and can be easily removed.

## The Ball Bearing Door-Hanger.

The illustration below shows a Hanger known as the "Ball Bearing" Door-Hanger, which is manufactured by the Cohoes Iron Foundry and Machine Company, Cohoes, N. Y. A special feature of this hanger is the absence of journal bearings. By inspection of the engraving it will be seen that the traveling bar is of a shape very nearly corresponding to the rail. It rests upon glass balls one inch in diameter, which are held in position in a spacer of sheet metal by steel pins passing



The Ball Bearing Door-Hanger, Made by the Cohoes Iron Foundry and Machine Co., Cohoes, N. Y.

freely through them. The lower edge of the traveling bar is hollowed out, corresponding to the size of the balls, thus insuring accurate position at all times. The manner of

photographs of Bordeaux, photograph albums and opera-glasses. Canned goods are in good supply, but of shoes, boots, ready-made clothing, blankets, and such articles as the pioneer generally finds serviceable, none whatever. The French among themselves and on their own soil are to a certain extent practical. Of the great world outside France they must have experience before they can have the knowledge that has a sound commercial value."

## Improving New York Harbor.

Gen. Roy Stone is at work deepening Gedney Channel, in New York Harbor, under an appropriation of \$200,000 by the last Congress. The contract provides that a channel 480 feet wide shall be cut through the bar, so as to give a depth of 28 feet at low water.

On February 15 General Stone began work on his plowing apparatus. Soundings

showed that the bottom of the channel was hard sand, packed so firmly that it was not easy to sink a tube in it to get specimens. He chartered the powerful tug Osceola and had it refitted at the Delaware Iron Works. Four pumping engines of a capacity of 1200 gallons a minute each were put in, besides a hoisting apparatus and three big electric lights. On each side of the boat was placed a big iron pipe connected by a shoulder

joint to the pump. The pipes were 52 feet long and 10 inches external diameter. At the lower ends they were curved forward, and ended in two nozzles, one of which pointed upward at an angle of about 45° and was 2½ inches in diameter, and the other opened directly in front, with a slight downward inclination, and was 1½ inches long and ½ inch wide. At a pressure of 100 pounds to the square inch the pumps will send 4800 gallons of water through the four orifices in the ends of the two iron pipes at a speed of 7000 feet a minute. The action of the water is continuous, as the pumps are in double gangs and the stroke alternates. A few weeks ago General Stone put his machine in operation, and after a few trials and some slight changes in the machinery it has begun again, and in earnest, to scour and plow out Gedney's Channel. The hydraulic plows were lowered and the pumps began to work. The horizontal water jets drilled a path through the tough sand, and the upper jet blew the sand to the surface of the bay and scattered it. The ebb tide carried the sand out to sea at the rate of 1½ miles an hour. Particles of sand could be seen suspended in the foam and froth above the nozzles of the pipes.

Soundings made last week show an increase in depth of from 8½ inches to 2½ feet wherever the plows had been at work. One day seven double furrows, each 5 feet wide, were cut in two hours. When the weather is favorable it is proposed to plow 10 hours a day, five during each ebb tide. There have been about 150 double furrows plowed so far. At the present rate it is believed that a channel 200 feet wide and 28 feet deep will be cut by June 1, and there is apparently no reason why the operations should not be extended until a channel 480 feet wide and 30 feet deep at low water is secured. The work has so far been more successful than was expected.

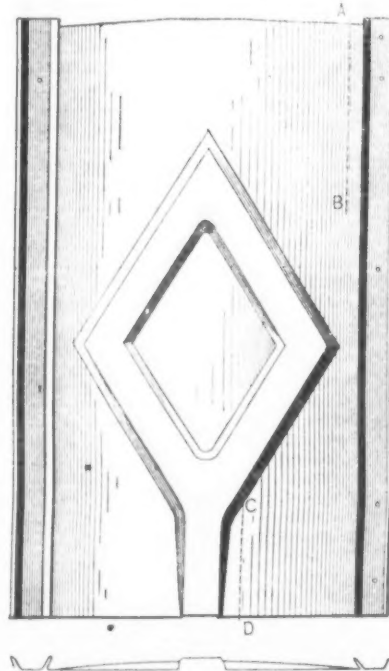
"It is only a question now," said General Stone, "of how many times the bar must be plowed over. That depends on how far the sand moves each time and how quick the tide will carry it away. Ocean steamers are aiding us. When the hard crust is once broken their screws stir up the soft sand beneath and it floats away with the tide. We are getting along faster than the soundings show, for packed sand increases in bulk when it is stirred up, and the first result of the plowing was expected to raise the bottom just as plowing a field raises the surface. Twenty-five per cent. increase of bulk is always allowed for that. I have notified the pilot commissioners that the best water and softest bottom is where we are at work, and they can aid us by bringing the big steamers over our freshly-plowed bottom. We have found dumpings from mud scows in the channel."

## The Patten Tin Shingle.

Messrs. Gummey, Sperry, Ingram & Co., of 1023 Market street, Philadelphia, Pa., have just ready for the market a new tin shingle, illustrations of which are presented in the accompanying engravings. It is to be known to the trade as the "Patten" tin shingle. This shingle, it is claimed, combines many excellent features which render it more desirable for use than others which have preceded it. It is needless to dwell upon the advantages claimed for tin shingles in general. Suffice it to say that this style of tin roof is growing in favor with the general public, and bids fair, from present indications to make great inroads upon the old styles of tin roof, if not to entirely supersede them. The essential feature of this shingle is that the different pieces forming the roof are firmly attached to each other at all essential points without the use of solder, and that they are fastened to the sheeting boards in such a way as not to be torn up by the wind. At the same time, contraction and expansion are fully provided for. This is accomplished by the double-locking dovetail joint, which is clearly shown in the engravings.

On the right of the shingle there are two flanges oppositely inclined to the face of the plate, with a flat valley between them. Nails through perforations in this valley secure the shingles to the sheeting. The left side of the shingle has two corrugations,

so situated and of such a size as to pass over the flanges of the plate already attached. When so placed the corrugations, with their contained flanges, form a joint which locks the second plate to the first already attached to the sheeting. This joint, besides being



The Patten Tin Shingle.—Fig. 1.—General View of Shingle, with End Elevation and Partial Sections (A B and C D), Showing the Formation of the Hood.

water-tight, is of such a character as to admit of the contraction and expansion of the metal. The manufacturers claim that by this method the shingles are more firmly attached to the roof-boards and to each other than is possible by any other method in use. At the same time the operation is so simple that the work can be done by any person of

ordinary intelligence. These triangular flanges, in connection with the corresponding up-turned flanges at the top of the lower plate, form an open space extending from the side joint to the hood, which prevents the upward passage of water by capillary attraction. The body of the securer, which fills the joined valley, prevents the upward driving of water through the joint. These several features will be better understood by reference to the engravings. The cleats or securers are each provided with two nail holes, thus giving the workman an opportunity of avoiding cracks or seams in the sheeting boards.

Some of the special advantages to which the makers direct attention may be enumerated as follows: The shingles being formed of a material of acknowledged excellence for the purpose, and the manner of application being such as not to interfere with the good qualities of the metal under variations of temperature, a roof covered with them and properly cared for will be very durable. The weight of this roof covering, which is less than 80 pounds to the square, is so slight as to require less strength in the roof framing than for slate, for example, with which these shingles very closely compete. It is also claimed that it is impossible for this roof to leak. The side joints are evidently impenetrable, and the lap is so secured by the two triangular flanges and the open space between that under no combination of circumstances can water pass up the sheeting and produce a leak. The security of these shingles is such by reason of the method of fastening to the sheeting boards that they cannot be blown off or loosened in the most severe storms. These shingles are packed in boxes for shipment containing a square, or 100 square feet. The design, it is claimed, is such as to make the use of the shingles, in addition to all the

advantages above enumerated, ornamental, and the manufacturers direct attention particularly to the fact that they can be artistically treated, so as to harmonize with the general style of the structure to which they are applied as a covering. The finish of the ridge shown in Fig. 4 of the accompanying engravings is characteristic, and is

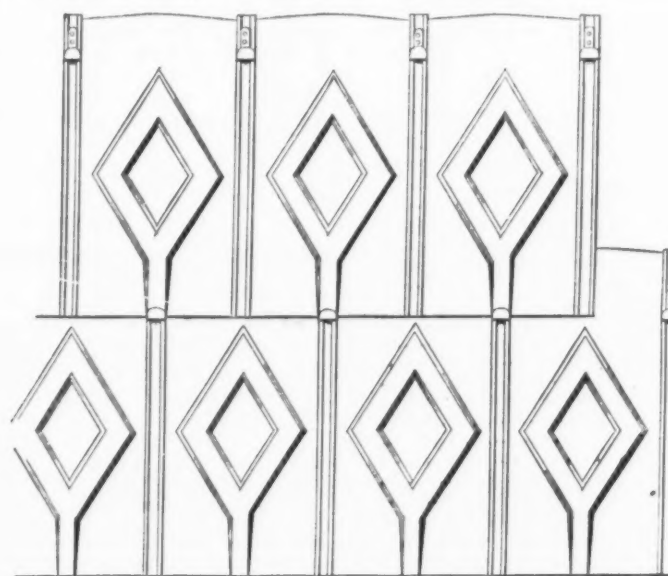


Fig. 2.—Manner of Flacing the Shingles on a Roof.

based on the same general principles as are embodied in the shingles. A piece of metal slightly bent is fastened to the ridge board, and its flanges extend into the side points of the ridge. The ridging is slipped on endwise, and its lower flange is held in place by the cleats or fasteners that are used for holding the lower edges of the shingles. This ridging is furnished in various lengths to meet requirements. It adds materially to the appearance of a roof. Another style is furnished when required, having a roll at the top.



Fig. 3.—Three Views of Cleat or Securer the Use of Which is Shown in the Preceding cut.

able to remove the roof covering at any time these corrugations and flanges can be readily disconnected and the joint unlocked.

Another prominent feature of this shingle is the hood which covers the joint of the plates below, and the securer or cleat which,

The Harrington & King Perforating Company have in course of erection a two-story brick building, 40 x 150 feet, located at 224 and 226 N. Union street, Chicago, which they expect to have completed about May 1. They will occupy the whole building with stamping and perforating machines, and thereby gain increased facilities and conveniences for their growing trade. They have recently received several very large orders for rolling screens, to go into the

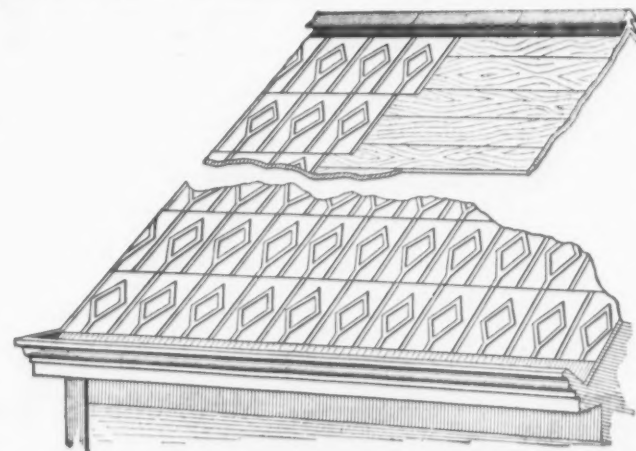


Fig. 4.—General Appearance of a Roof Covered with the Patten Shingles.

passing over the hood, draws it down upon the joint, and firmly secures the upper tier of shingles to those beneath at the middle portion of their lower edges. This fastening of the hood also holds the triangular flanges on the lower edge of each shingle against the surface of the plates below, thus forming a square transverse joint between the two

mining regions as soon as the weather moderates.

The recent coal discoveries in Mexico, we see it confidently stated, will entirely revolutionize the mining industry of that country.



**Strikers in Chicago.**—About 175 employees of the American Cutlery Company, Chicago, went out on a strike on the 6th inst., having made a demand of 15 per cent. advance on their wages, which was refused. They withdrew to an adjoining hall, where a meeting was held and a labor union organized, which embraces only the employees of these works. They agreed to impose a penalty of a sound thrashing upon any member who returns to work during the strike at the same or less wages. The company report trade exceedingly dull, and say that they will suffer no inconveniences from the strike, and have no intention of acceding to their demand. The majority of the strikers are piece-workers, and there will be no difficulty in filling their places with other workmen should it be found necessary to again commence operations.

Work was resumed by the North Chicago Mills Company at its South Chicago Mills on Monday, April 5, in accordance with an agreement signed two or three weeks ago. The wages are fixed by a sliding scale. The mills will be run on two shifts of 12 hours each. About 1800 men are now employed. The North Chicago Mills of the same company will probably close down in a few days for a short time in order to make the necessary changes for the manufacture of structural steel. The new manufacture will commence about July 1.—*Journal of Commerce.*

It might be questioned whether in the whole civil service of the United States there is a more important office than the chief appraisership of New York. Imagine a port that collects about \$130,000,000 duty out of \$200,000,000 all told, and further imagine that this vast amount is appraised and consequently adjusted in one large building over which the chief appraiser presides, and then we may understand what a chief appraiser of New York means.

All the employees of the McCormick Reaper Company, Chicago, except a score or so of non-union molders, quitted work on the 7th on a strike for the restoration of wages to the rates existing before the reduction of 15 per cent. Some 1600 men are now out.

The Wilcox Mfg. Co., of Aurora, Ill., are preparing to occupy their new works, to which they have just completed an addition 18 x 56 feet in size, two stories high, giving them 10,000 square feet of floor surface. The entire building is to be heated by steam.

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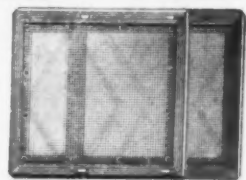
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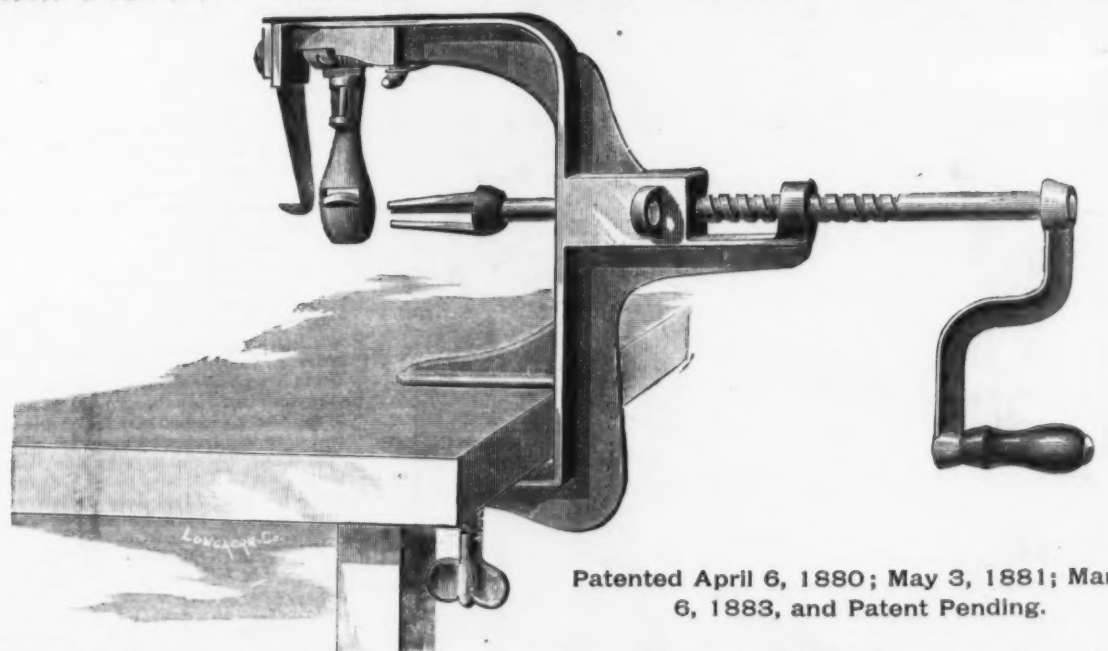
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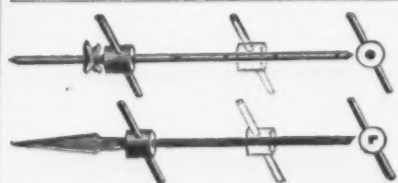
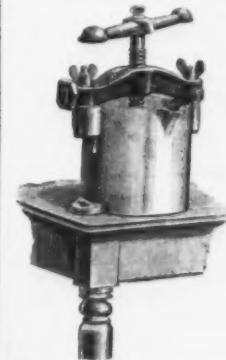
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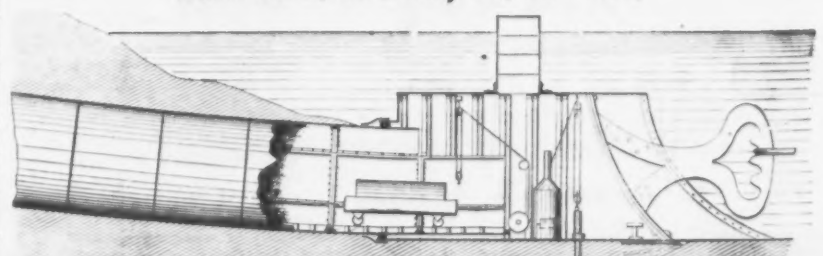
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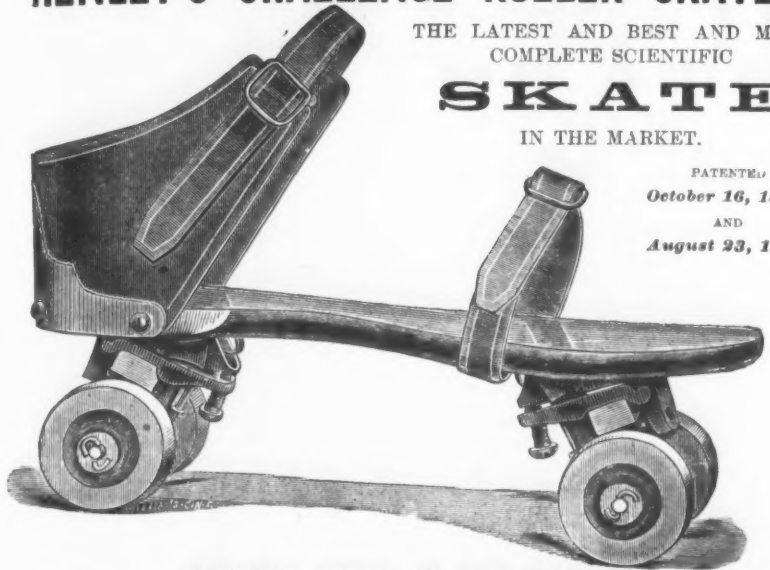
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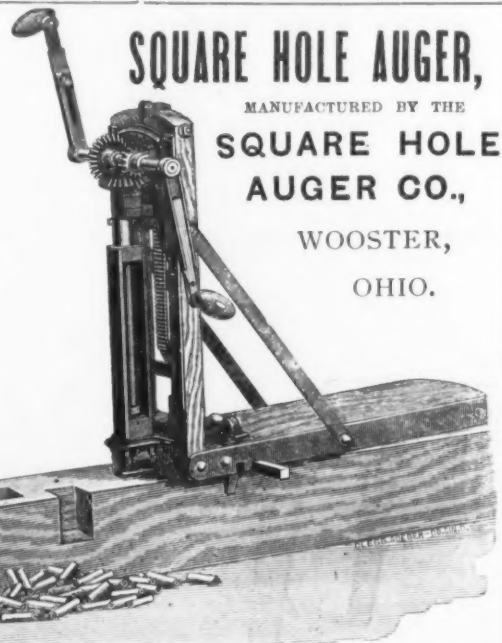
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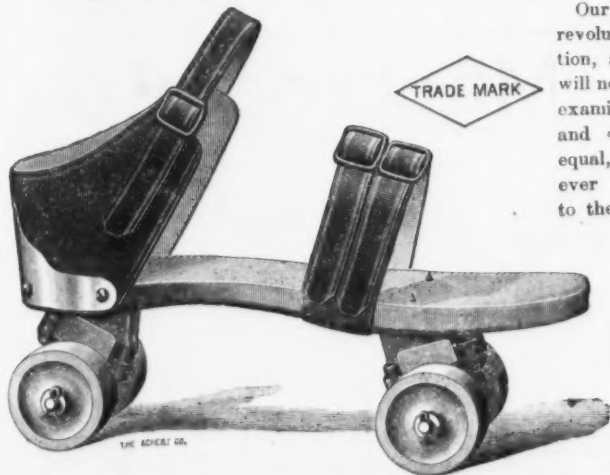
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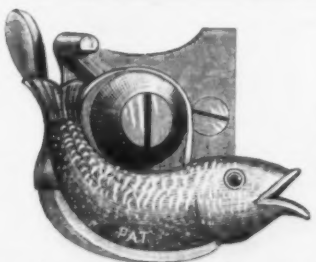
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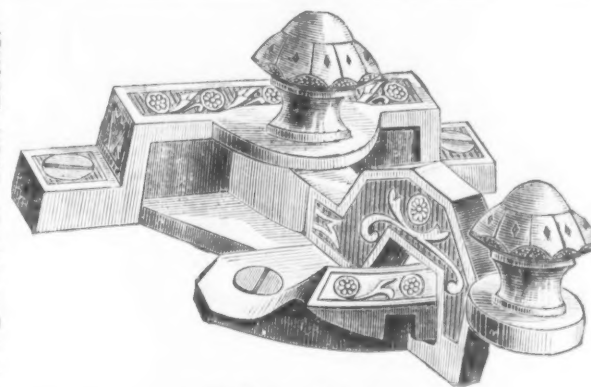
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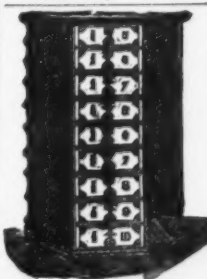
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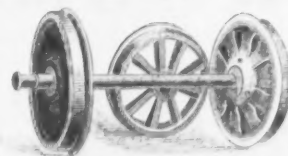
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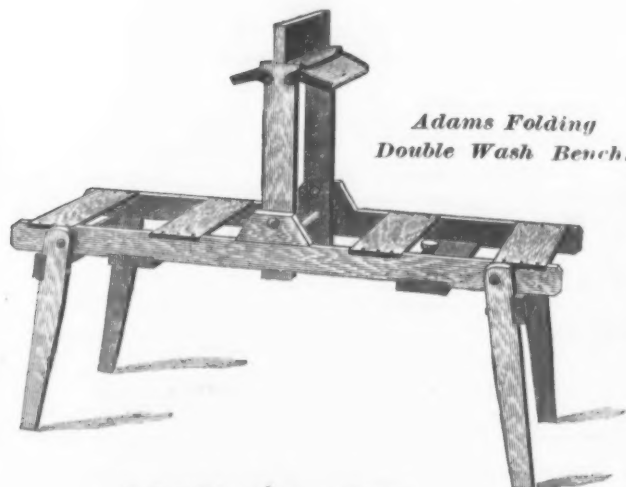
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## Patent Household Articles.

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Adams Folding  
Double Wash Bench.



THE LATEST THING OUT.  
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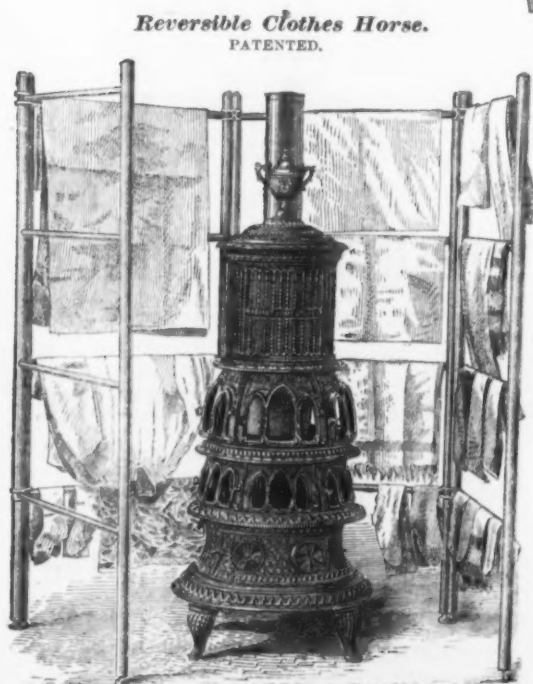


Cyclone Mouse Trap.  
PATENTED NOV. 6, 1883.

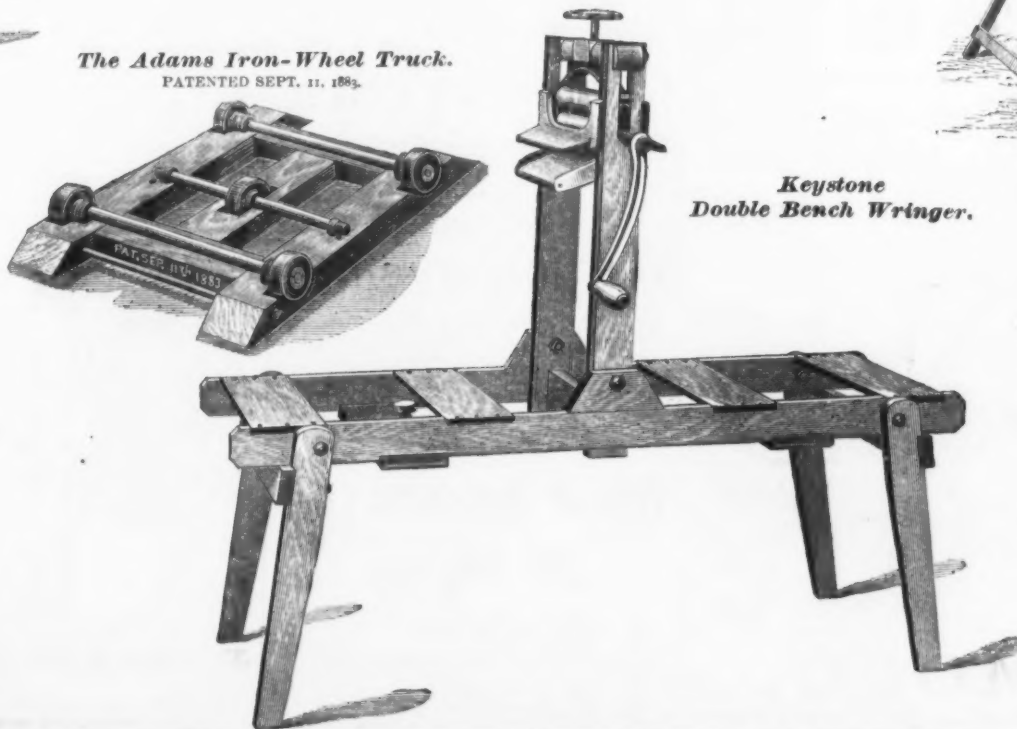
200,000 SOLD SINCE JAN. 1, 1884



Duplex No. 2 Swing.

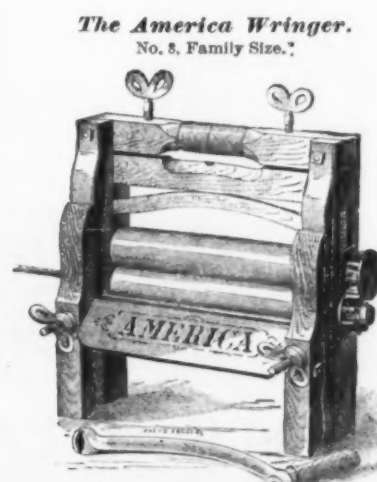


Reversible Clothes Horse.  
PATENTED.



The Adams Iron-Wheel Truck.  
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Keystone  
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The America Wringer.  
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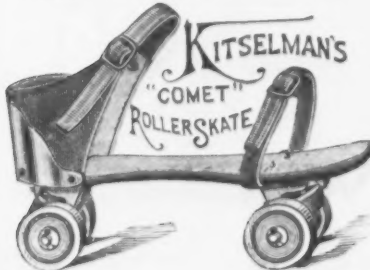
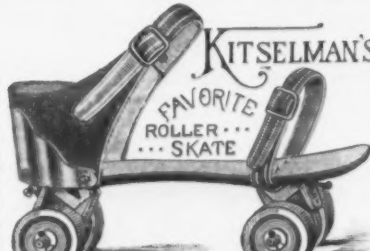
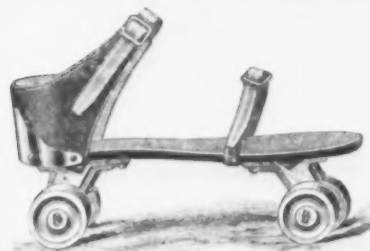
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A. The locking bar.  
B. The self-locking adjusting  
block.  
C. The operating rod.  
D. The lower bracket.  
E. The lifting arm.  
F. The transverse bracket.

## PATENTS.

GEO. H. BENJAMIN,

Engineer, Expert in Patent Causes.

AND SOLICITOR OF

American and Foreign Patents,

No. 284 BROADWAY, NEW YORK.

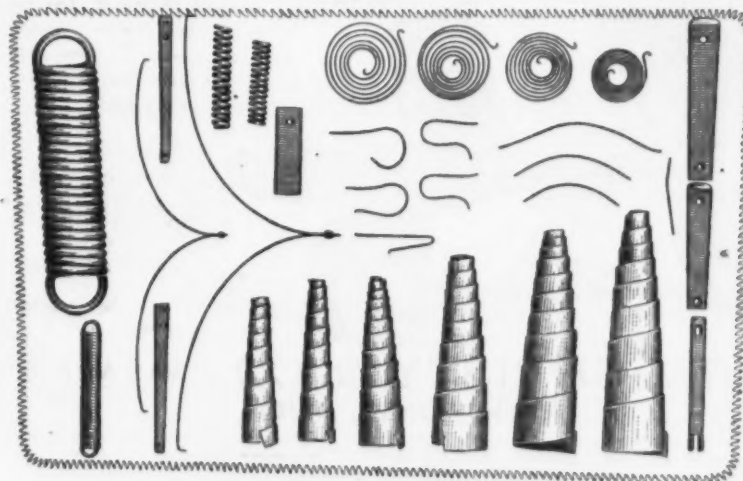
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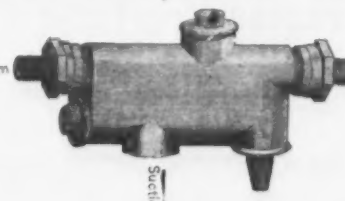
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1885

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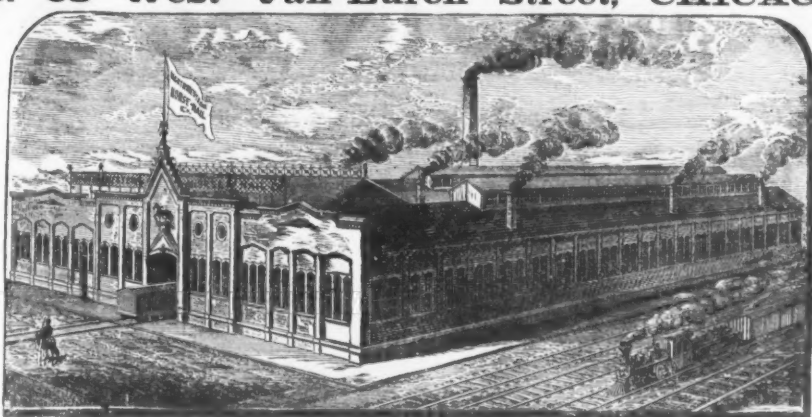
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E. M. BOYNTON SAW & FILE CO. BOYNTON BROS. LATEST PATENT. E. M. BOYNTON, PRESIDENT. C. W. BOYNTON, VICE PRES. N. Y. CITY.

PATENTED NOV. 25<sup>TH</sup> 1884



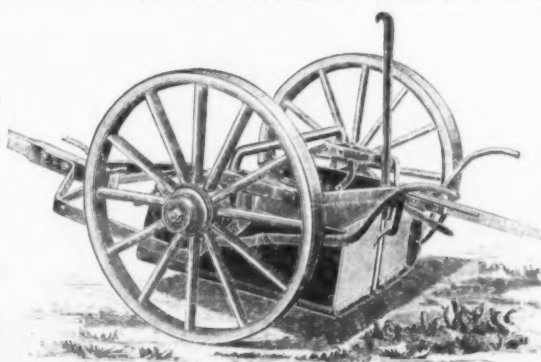
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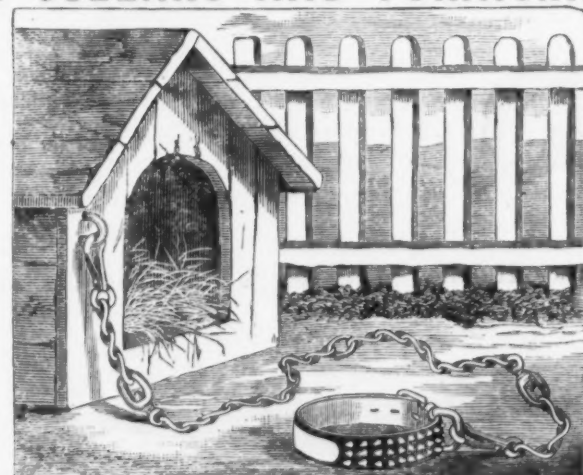
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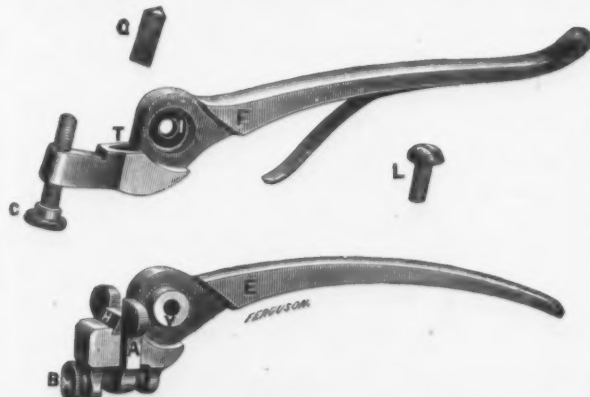
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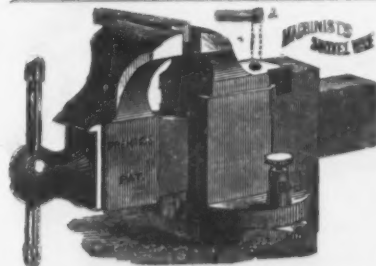
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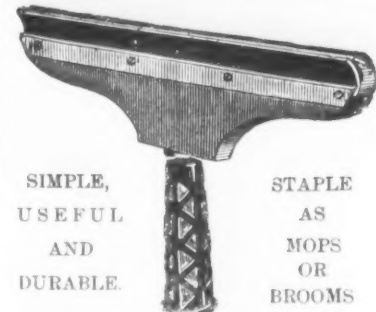
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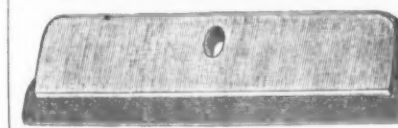


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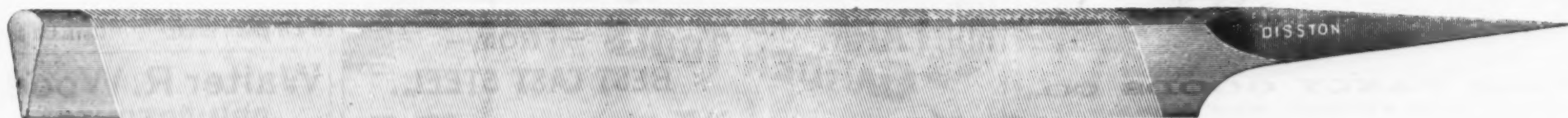
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Fig. 3 shows the section of the file in the gullet of the saw.

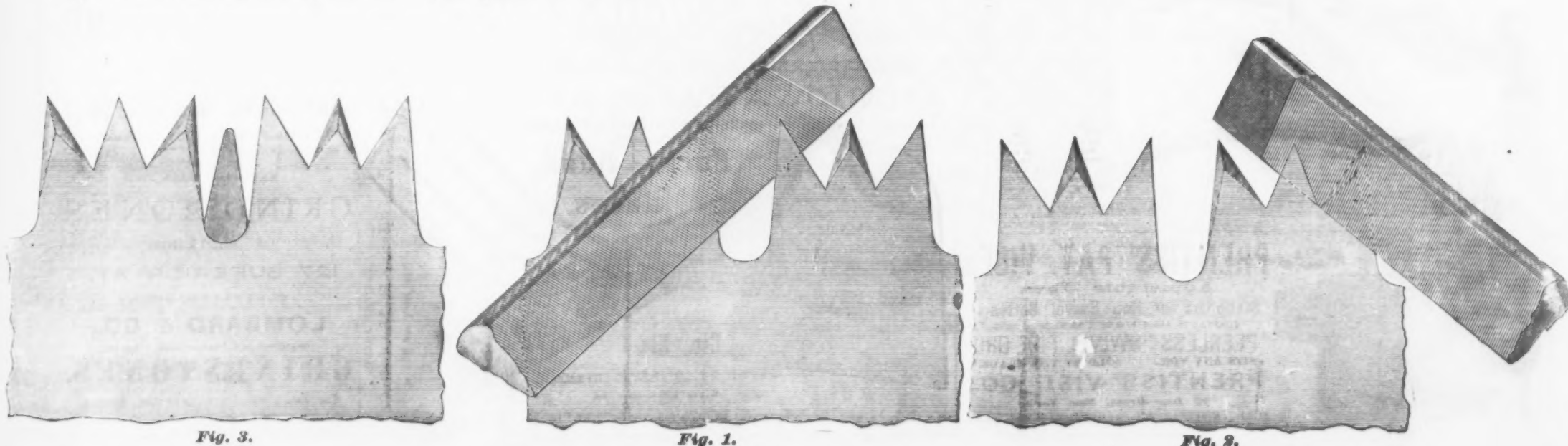


Fig. 3.

Fig. 1.

Fig. 2.

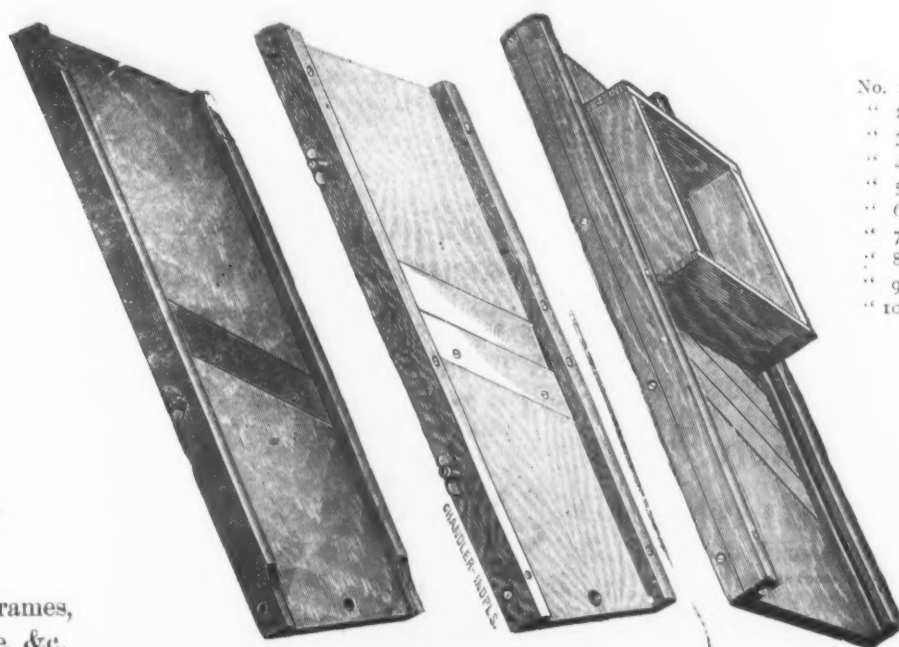


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" 4.....	4 " " " "
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" 7.....	3 " " " " " "
" 8.....	4 " " " " " "
" 9.....	3 " " 12 x 40, " "
" 10.....	4 " " " " " "

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Yours truly,  
R. G. MARTIN.

**MERCHANT & CO.,**  
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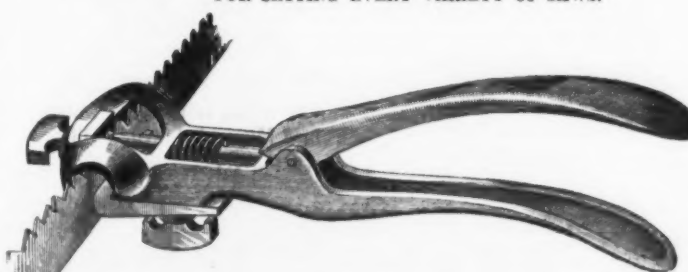
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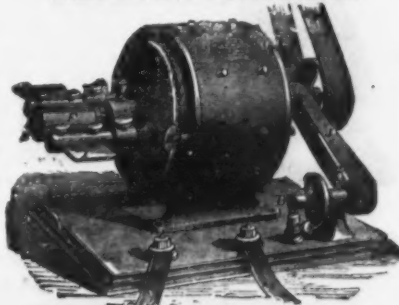
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For Nickel, Bronze, Brass, Copper and Silver Plating.

A greater number in use than all others combined

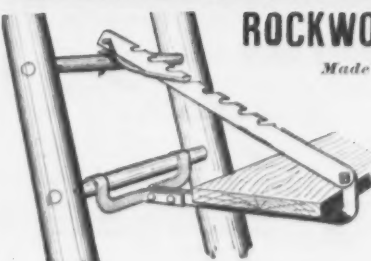
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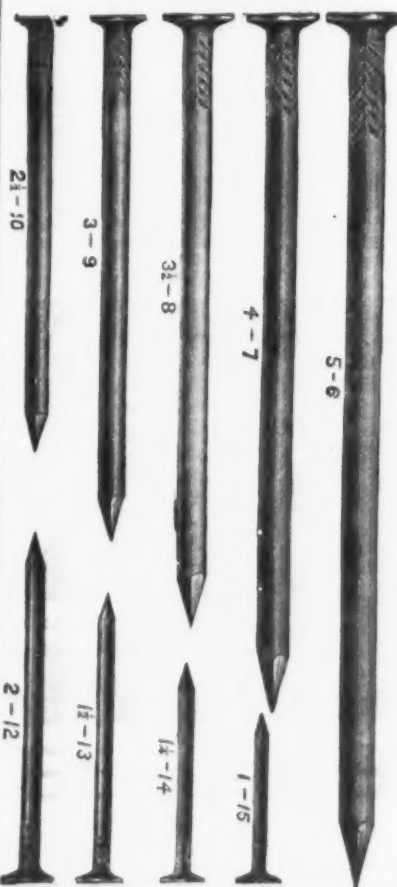
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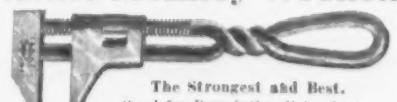
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Soft Small Gray Iron Castings a Specialty.

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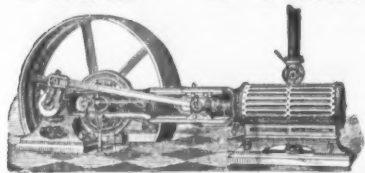
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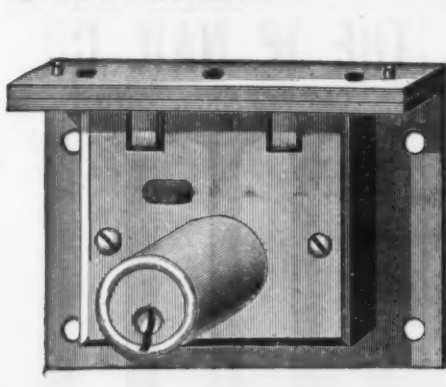
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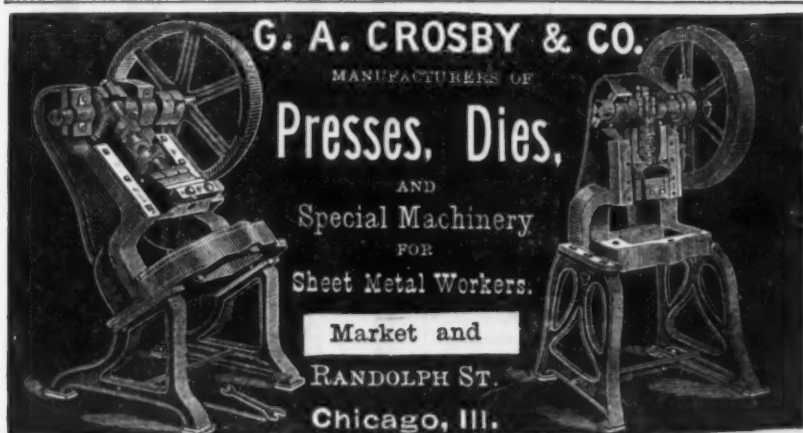
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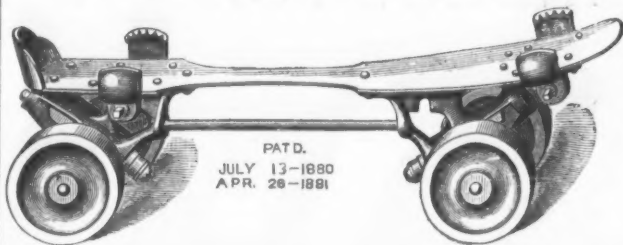
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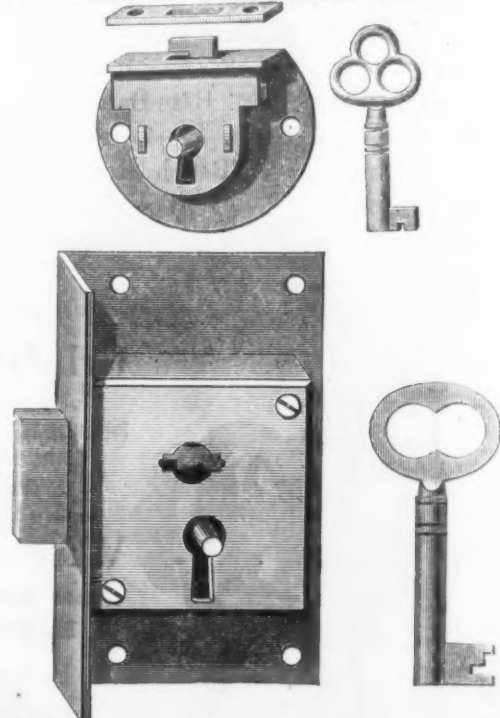
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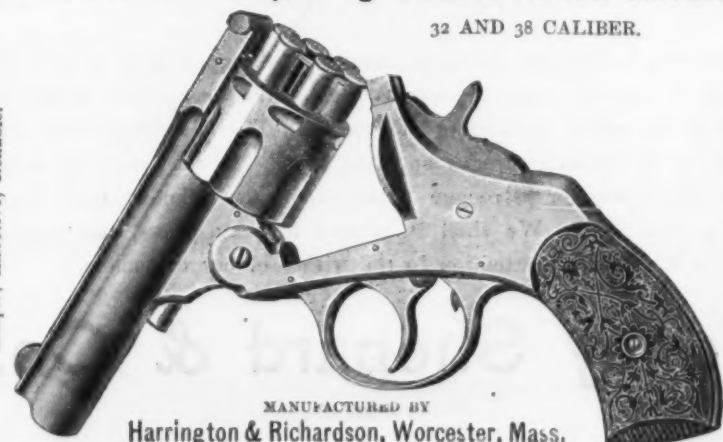
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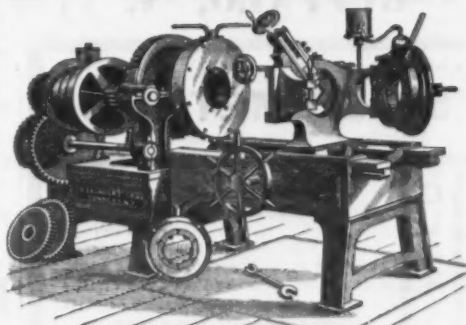
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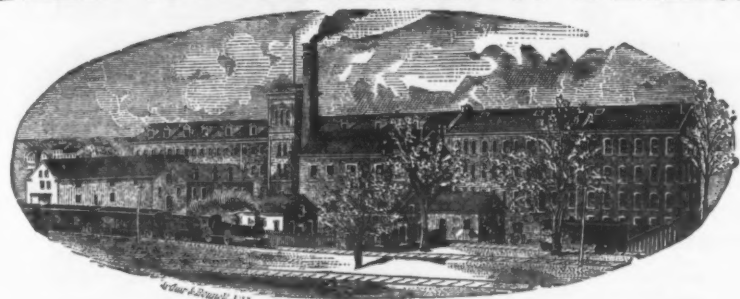
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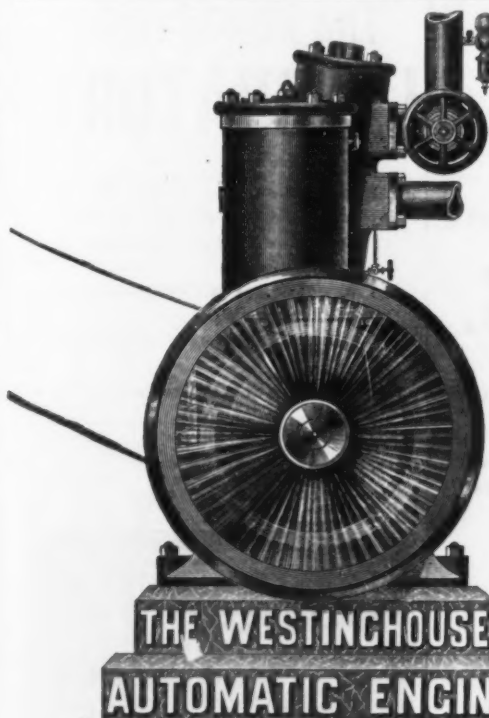
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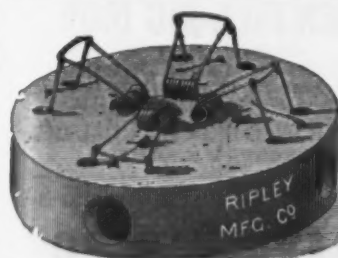
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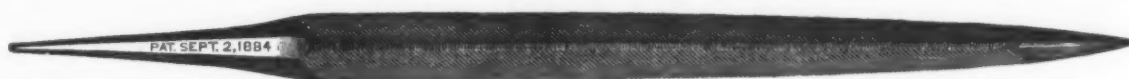
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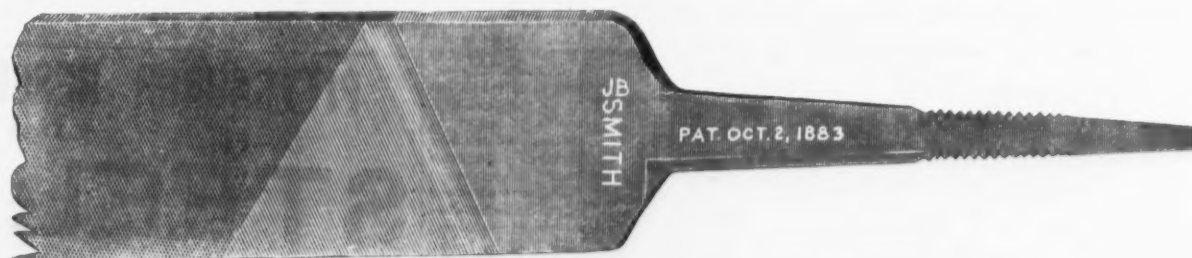
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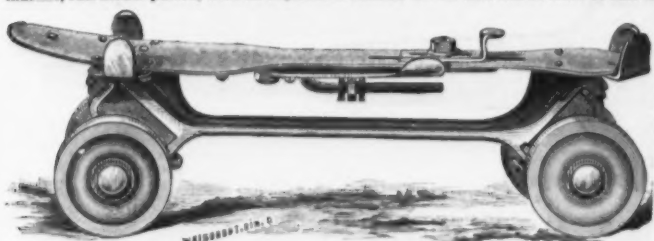
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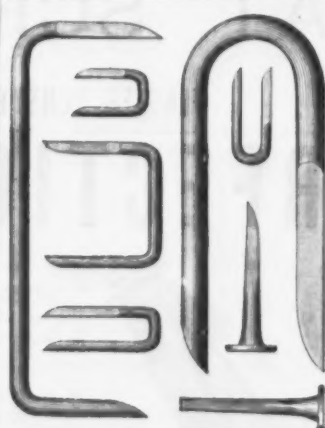
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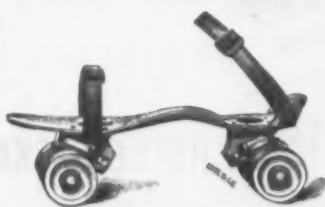
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ESTABLISHED IN 1859.



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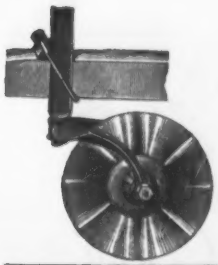
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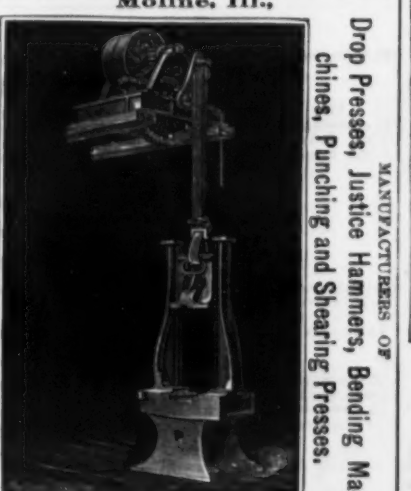
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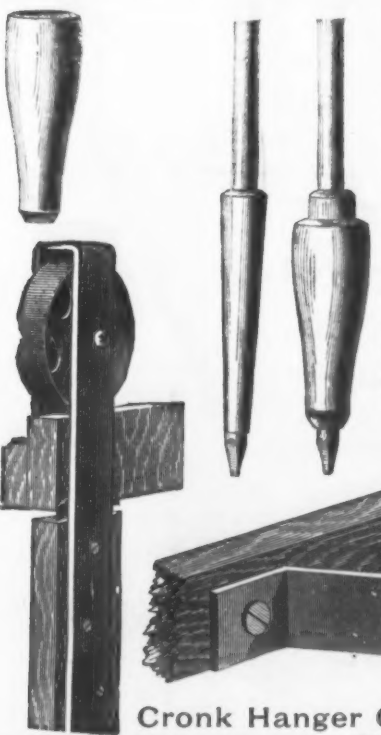


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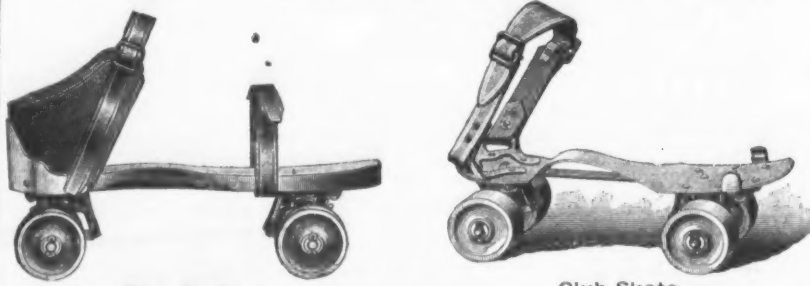
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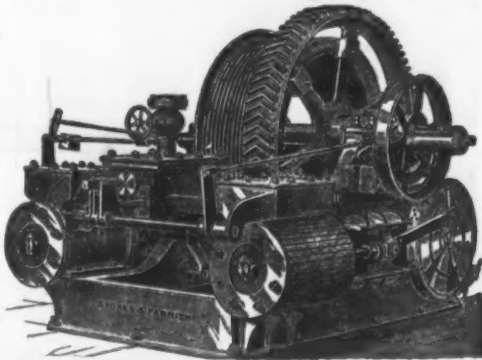
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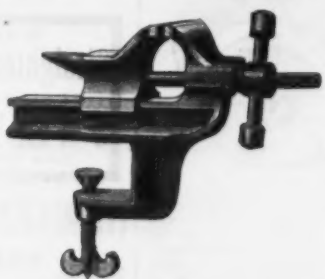
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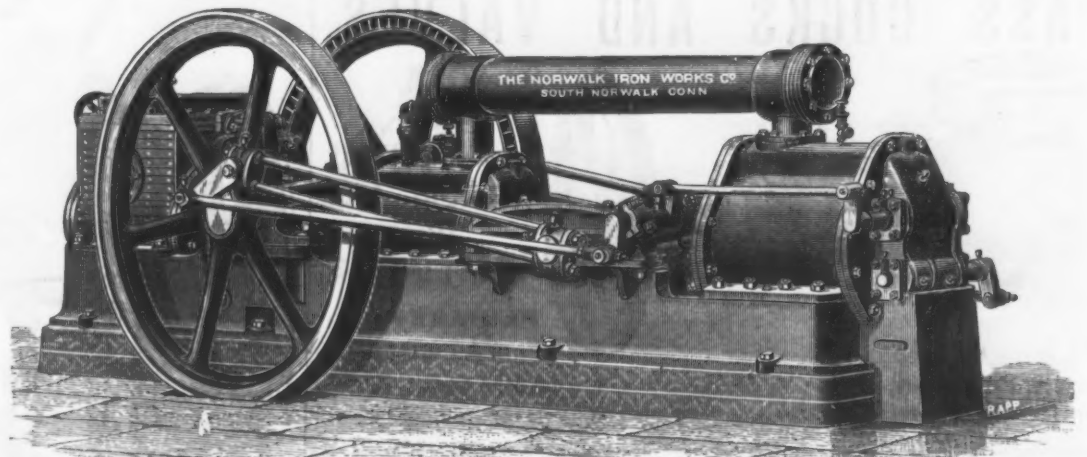
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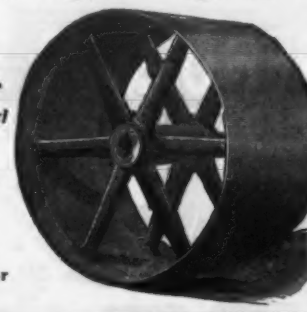
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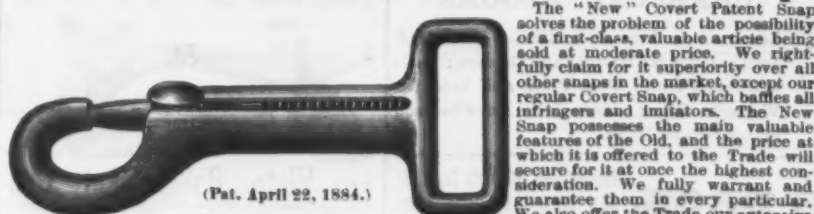


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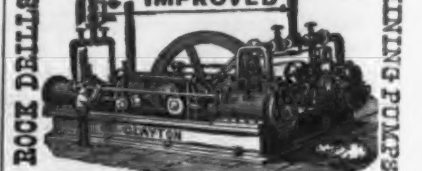
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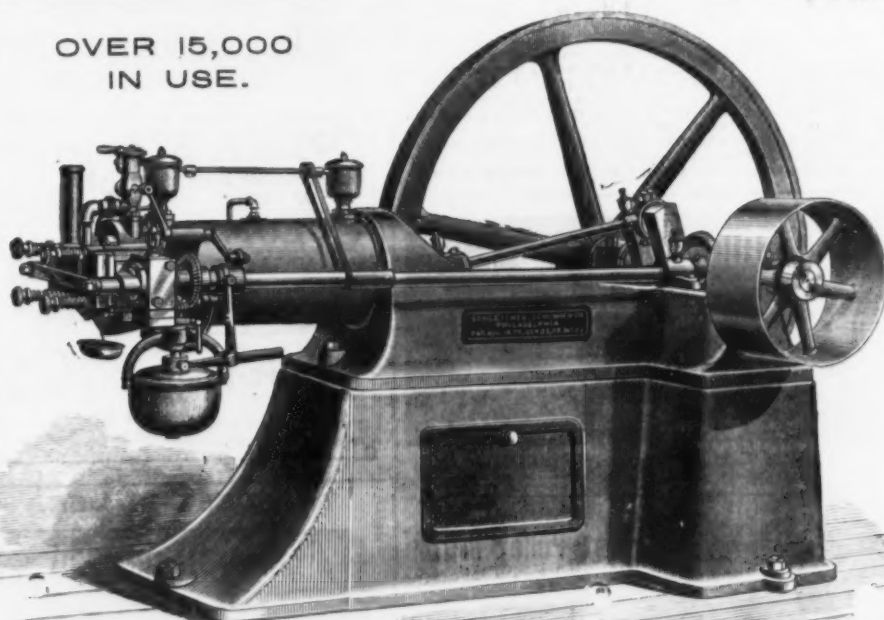
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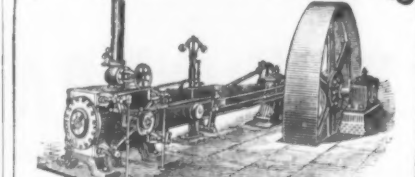
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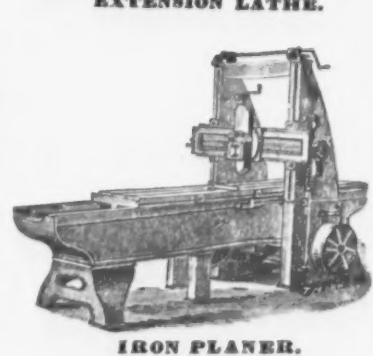
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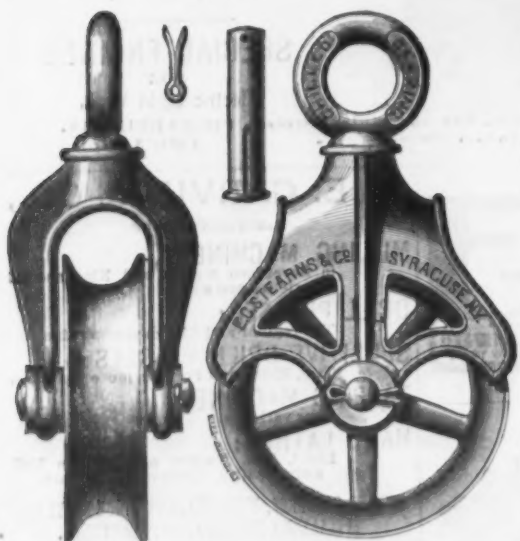
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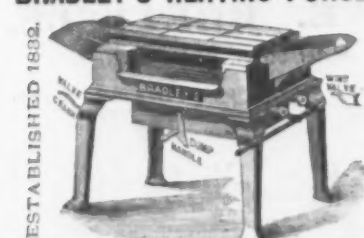
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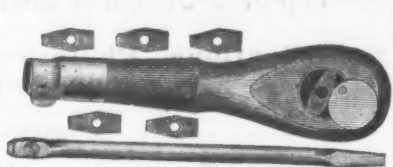
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